

T A M U G



1996-97 UNIVERSITY CATALOG

1996-97 CATALOG NO. 119

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ACADEMIC CALENDAR

Fall Semester 1996*

**These dates are subject to change.*

August 28–30	Wednesday–Friday. Terminal Registration for new students only.
August 30	Friday. Last day to register for fall semester classes and pay fees.
September 2	Monday. First day of fall semester classes.
September 5	Thursday. Last day for dropping courses with no record.
September 6	Friday. Last day for adding new courses for the fall semester.
September 13	Friday. Last day to apply for all degrees to be awarded in December.
October 21	Monday. Mid-semester grades due in Registrar's Office, 10 a.m.
November 8	Friday. Last day for all students to drop courses with no penalty (Q-drop). Last day to officially withdraw from the university.
Nov. 18–Dec. 6	Monday–Friday. Pre-registration for 1996 spring semester by classification.
November 28–29	Thursday–Friday. Thanksgiving Holiday.
December 9	Monday. Redefined day; students attend their Friday classes. Dead day.
December 10	Tuesday. Last day of fall semester classes. Redefined day; students attend their Thursday classes. Dead day.
December 11–12	Wednesday–Thursday. Reading days, no classes.
Dec. 13, 16–18	Friday, Monday–Wednesday. Fall semester final examinations for all students.
December 20	Friday. Final grades for all students due in Registrar's Office, 12 noon.
December 21	Saturday. Commencement and Commissioning, 9 a.m.

Spring Semester 1997*

January 9–10	Thursday–Friday. Terminal registration for new students only.
January 10	Friday. Last day to register for spring semester classes and pay fees.
January 13	Monday. First day of spring semester classes.
January 16	Thursday. Last day for dropping courses with no record.
January 17	Friday. Last day for adding new courses for the spring semester.
January 20	Monday. Holiday—Martin Luther King, Jr. Day.
January 24	Friday. Last day to apply for all degrees to be awarded in May.
March 3	Monday. Mid-semester grades due in Registrar's Office, 10 a.m.
March 10–14	Monday–Friday. Spring Break.
March 28	Friday. Reading day, no classes.
April 1	Tuesday. Last day for all students to drop courses with no penalty (Q-drop). Last day to officially withdraw from the university.
April 14–29	Monday–Tuesday. Pre-registration for the 1997 first term, second term, 10-week summer semester and fall semester by classification.
April 28	Monday. Dead day.

April 29	Tuesday. Last day of spring semester classes. Redefined day; students attend their Friday classes. Dead Day.
April 30–May 1	Wednesday–Thursday. Reading day, no classes.
May 2, 5–7	Friday, Monday–Wednesday. Spring semester final examinations for all students.
May 10	Saturday. Commencement, 9 a.m.
May 12	Monday. Final grades for all students due in Registrar's Office, 10 a.m.

Summer Sessions 1997*

May 30	Friday. Open registration and drop/add for first term and 10-week semester by telephone and by terminal. Last day to register for first term and 10-week semester.
June 2	Monday. First day of first term and 10-week semester classes.
June 4	Wednesday. Last day for dropping courses with no record for the first term and 10-week semester.
June 5	Thursday. Last day for adding new courses for the first term and the 10-week semester.
June 6	Friday. Last day to apply for degrees to be awarded in August for students completing degree requirements in the first term.
June 20	Friday. Last day for all students to drop courses with no penalty for the first term (Q-drop). Last day to officially withdraw from the university for first term.
July 3	Last day of first term classes.
July 4	Friday. Holiday—Independence Day.
July 7	Monday. First term final examinations. No 10-week semester classes. Open registration and drop/add for second term. Last day to register for the second summer term.
July 8	Tuesday. First class day of second summer term.
July 10	Thursday. Last day to drop courses with no record for second summer term. First summer term final grades due in Registrar's Office, 10 a.m.
July 11	Friday. Last day for adding new courses for the second term. Last day to apply for all degrees to be awarded in August for students completing degree requirements in second summer term or 10-week term.
July 28	Tuesday. Last day for all students to drop with no penalty for 10-week term courses (Q-drop). Last day to officially withdraw from the university for 10-week semester.
August 11	Monday. Last day of second summer term and 10-week term.
August 12–13	Tuesday–Wednesday. Second term and 10-week semester final examinations for all students.
August 14	Thursday. Grades for degree candidates due from departments.
August 16	Saturday. Commencement and Commissioning, 9 a.m.
August 18	Monday. Final grades for second summer term and 10-week semester due in Registrar's Office, 10 a.m.

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Glenn Jones	Associate Campus Dean for Research and Interim President of Texas Institute of Oceanography
William T. McMullen	Superintendent, Texas State Maritime Program

Texas A&M University at Galveston (TAMUG) is a totally ocean-oriented campus offering academic degrees, research, continuing education programs, and public service in marine science, engineering, business, and transportation. It is one of only six state maritime training academies in the United States and the only one located on the Gulf of Mexico. It is also the only training academy affiliated with a comprehensive research and teaching university.

In 1992, TAMUG merged with Texas A&M University in College Station as the "coastal campus." Texas A&M at Galveston represents one of the largest and most comprehensive concentrations of ocean and geosciences programs in the world. In 1994 the undergraduate Marine Sciences Department in Galveston merged with the graduate Department of Oceanography in College Station to create a single department spanning both campuses. The disciplines of atmospheric sciences, geography, geology, geophysics, and oceanography are taught in College Station; and marine biology, marine fisheries, oceanography (marine sciences), marine/maritime engineering, maritime administration (business/policy), and marine transportation are taught in Galveston.

TAMUG is located near the mouth of Galveston Bay with close access to the Gulf of Mexico. The University has facilities at three separate campus locations, the 130-acre Mitchell Campus on Pelican Island where instructional programs are taught (with housing for 600+ students); the three-acre Ft. Crockett Campus on Galveston Island, including an additional 15,200 sq. ft. of space leased from the National Marine Fisheries Services (which together provide approximately 90,000 sq. ft. for marine laboratory research); and the 10-acre Offatts Bayou Campus where the Center for Marine Training and Safety is located. Over 164 acres of wetlands located on west Galveston Island are available for ecological studies.

The purpose of this catalog is to provide information about the academic programs of TAMUG to students and prospective students as well as faculty and staff. Included is information concerning admissions, academic regulations and requirements, services available to students, academic offerings, and a list of administrative officers and faculty.

Academic Programs

TAMUG provides undergraduate academic instruction in seven marine and maritime-related degree programs in Marine Biology, Oceanography (Marine Sciences program), Marine Engineering Technology, Marine Transportation, Marine Fisheries, Maritime Systems Engineering (ocean/civil), and Maritime Administration (policy/business). Although unique courses have been developed in response to the marine orientation, all students complete the core curriculum requirements set by TAMU to ensure a broad-based education. All students receive Texas A&M University degrees. Cooperative graduate degree programs, at both the master and doctorate levels, are in place with the departments of Oceanography, Biology, and Wildlife and Fisheries Sciences at TAMU in College Station. The Texas State Maritime Program is headquartered on the Galveston Campus and affords selected students the option of working toward a license as an officer of the American Merchant Marine.

Academic Facilities

Classrooms, laboratories, and meeting spaces are housed within 10 major buildings on the Mitchell Campus. There are three residence halls on campus, and a student center with cafeteria services. A new physical education facility opened in 1994. The Jack K. Williams Library contains over 43,000 books, 35,000 bound volumes of journals, and a collection of charts and maps. Public access terminals in the Library guide the user to the holdings of the Williams Library, the Galveston Bay bibliography, and many other library catalogs and computerized databases. The training ship (T/S) TEXAS CLIPPER II, in addition to being a floating campus during summer cruises, provides additional classroom, meeting, and training space during the school year. The TEXAS CLIPPER II embarked on her maiden voyage during the summer, 1996. TAMUG has telecommunications systems established to communicate statewide within the Texas A&M University System universities and agencies. The Galveston campus has direct access to the TAMU computer network in College Station via remote job entry connect lines.

Research Programs

Over 35 TAMUG faculty actively participate in extramural research encompassing both the basic and applied aspects of fields such as marine environmental and conservation studies; and marine/maritime engineering, business, law, policy, and management. Research is focused largely in the areas of coastal and beach processes, marine life studies, bay and estuary ecosystems, the offshore/deepwater environments, and geochemical cycling in the marine/aquatic/atmospheric systems.

In addition to the approximately 70 M.S. and PH.D. students supported by the research projects of TAMUG faculty, there exist numerous opportunities for undergraduate students to participate in research projects throughout the academic year and summer months.

An average of 50 to 100 funded research projects are active at any one time. These projects bring an average of \$2.7 million/year to the Galveston campus from agencies such as the National Science Foundation, the Office of Naval Research, NOAA, EPA, Sea Grant, the State of Texas, and a variety of private foundations and businesses. Most notable of these is the TAMUG-based Texas Institute of Oceanography, whose mission is to support Texas scientists conducting basic research in the marine sciences, and to provide the research and technological base for the development of marine-related businesses in Texas and around the Gulf of Mexico. Other research programs at TAMUG include the:

- Center for Texas Beaches and Shores
- Center for Ports and Waterways
- Center for Marine Life Studies
- Laboratory for Oceanographic and Environmental Research
- Coastal Zone Laboratory
- Marine Mammal Research and Graduate Program
- Mathematical and Theoretical Chemistry Program

In recent years TAMUG has further strengthened its research program by developing agreements to foster collaboration between TAMUG researchers and scientists at federal

and state research laboratories such as the Army Corps of Engineers, the National Marine Fisheries Service, and the Texas Transportation Institute. We continue to strengthen our research program with the proposed (1997) purchase of a new 70,000 sq. ft. building for our Ft. Crockett campus, and expansion in research in Coastal Oceanography.

Accreditation

Texas A&M University at Galveston is fully accredited by the Southern Association of Colleges and Schools. The Marine Science program is accredited by the Accreditation Board for Engineering and Technology (ABET). Documents certifying accreditation may be viewed in the Office of the Campus Dean.

Mission

Texas A&M University at Galveston is a special-purpose institution of higher education for undergraduate instruction in marine and maritime studies in science, engineering, and business and for research and public service related to the general field of marine resources. The institution is under the management and control of the Board of Regents of The Texas A&M University System, with degrees offered under the name and authority of Texas A&M University at College Station.

Compliance Policy

Within published requirements for admission, Texas A&M University at Galveston does not and will not discriminate in admission of students to study at TAMUG, enrollment in classes, housing or use of facilities in the academic program because of race, color, religion, sex, age, marital status, national origin, condition of handicap, veteran or disabled veteran status. TAMUG does not and will not discriminate against any employee or applicant for employment because of race, color, religion, sex, age, marital status, national origin, condition of handicap, veteran or disabled veteran status.

TAMUG embraces affirmative action practices to ensure that applicants are hired fairly, and that employees are treated during their employment without regard to race, color, religion, sex, age, marital status, national origin, condition of handicap, veteran or disabled veteran status. Such action includes, but is not limited to, employment, upgrading, demotion or transfer, recruitment or recruitment advertising, layoff or termination, rates of pay or other forms of compensation, and selection for employment training, including apprenticeship.

Limited services and facilities are available to students with handicaps. Individuals should contact the Office of Student Affairs if they have special needs before they commit to enrollment.

The Compliance Officer of TAMUG is the Campus Director of Human Resources. Any questions or complaints relative to discrimination should be referred to the Human Resources Office.

Continuing Education Programs

Continuing education facilities are housed at the Offatts Bayou and Ft. Crockett campuses. The Center for Marine Training and Safety offers broad-based professional

development to employees of coastal and offshore maritime industries. The outreach programs of the university include: Seaborne Conservation Corps, a residential program for high school dropouts; Sea Camp, a marine biology summer camp for youths 10-16 years of age; and Elderhostel, a marine environment-oriented camp for senior citizens. The Oil Spill School and the Oil Spill Response Center both serve to provide protection from disasters. Marine safety programs, radar observer schools, workshops on beach ecology, and summer programs are regularly offered.

Computer simulation systems for ship operations (both bridge and engine) and for oil spill response are available for undergraduate and continuing education programs.

Public Service Programs

The Galveston Bay Information Center has developed a computer-searchable Galveston Bay bibliography which is linked with a local network including an interactive model of Galveston Bay circulation and COMPASS, an information system developed by NOAA. The Texas Agricultural Experiment Station (TAES) helps TAMUG serve the educational needs of the Galveston area agricultural community. The Texas Marine Mammal Stranding Network is linked statewide to aid in the recovery and study of stranded marine mammals. The Texas Transportation Institute regional office is established to link waterway components to the state's intermodal transportation research and it houses the Center for Ports and Waterways.

Summer School at Sea

Recent high school graduates who have never attended college may participate in the Summer School at Sea program conducted aboard the T/S TEXAS CLIPPER II during the annual summer training cruise. Usually, four college courses are offered and students enroll in two of the four. In addition to daily classes, students are also responsible for assisting the ship's crew in maintaining and operating the TEXAS CLIPPER II, assisting with galley duty and maintaining their quarters during the training cruise.

While it is hoped the Summer School at Sea participants will continue their collegiate careers at Texas A&M University at Galveston, the academic credits earned during the summer cruise are transferable to other colleges and universities which they may attend.

Students must be admitted to TAMUG or TAMU (College Station) before applying to attend Summer School at Sea. Since the courses offered are freshman courses, applicants must be between high school graduation and freshman year in college. Information about the program and the "Summer School at Sea Form" are available from the Student Relations Office.

GENERAL INFORMATION

Students who complete the academic programs of Texas A&M University at Galveston are awarded the degree of Texas A&M University (College Station). Therefore, students enrolled in Texas A&M University at Galveston must adhere to the same basic academic requirements as students enrolled at Texas A&M University (College Station). Students are advised of these requirements and are encouraged to be familiar with the Texas A&M University at Galveston Academic and Student Life Regulations.

Students are required to complete the courses listed in a curriculum; however, the display of a curriculum does not necessarily indicate the length of time required to complete the degree requirements. Rather, this display is intended as a guide to indicate the preferred order for completion of degree requirements. Exceptions to certain requirements may be made by petition, through the department head to the campus dean.

This catalog was prepared in advance of its effective date; therefore, some course descriptions may vary from actual course content due to advancements in the discipline, interests of individual professors or recent decisions to change the scope of a course. The catalog is not intended to be a contract, but simply an information bulletin and the University reserves the right to change any of the provisions. Some new courses and changes to existing courses are included in this catalog pending their approval by the Texas Higher Education Coordinating Board. A separate class schedule giving course offerings and other pertinent information is published each semester and is available on request from the Admissions and Records Office. Students should refer to the class schedule for the offerings in any given semester. For various administrative reasons, such as insufficient enrollment, some scheduled courses might not be offered in the announced semester.

Academic Year

The academic year of Texas A&M University at Galveston is divided into the fall and spring semesters and the summer session which consists of either two terms of five weeks each or one 10-week summer semester.

During the summer session, most departments offer courses which are selected to meet the needs of the regular university students. In addition, special summer curricula may be offered as part of the *Window to the Sea* program.

University Core Curriculum

The Core Curriculum at Texas A&M University assures that all undergraduate programs provide for breadth of understanding. The Core Curriculum emphasizes competence in the process of learning, the capacity to engage in rigorous and analytical inquiry, and the ability to communicate clearly and effectively. It supports the development of extensive knowledge about and appreciation for our cultural heritage, our social and moral responsibilities, and our interactions with economies and cultures of the international community. The Core Curriculum acts to enrich and broaden the University's tradition of providing thorough preparation in each student's academic major.

Core Curriculum requirements are described in the sections that follow. These re-

quirements must be met by every student pursuing a baccalaureate degree program at TAMUG, regardless of his or her major. Individual degree programs may require that specific courses from the general university list be used to satisfy Core Curriculum requirements. Please check with the individual program advisors for details.

Specific Requirements

1. **Computer Usage** Because the computer is a necessary and useful tool in learning, it is important to be proficient in its use. Students entering the University will have completed at least one course in computer science or will demonstrate proficiency through an examination. An examination to establish computer proficiency will be provided by the Office of Measurement and Testing at College Station. Otherwise, students will be required to complete a computer usage course for University credit to be selected from AGEC 22I; AGSL 20I; ANSC 40I; BANA 217; CPSC 110, 203; EDTC 445; ENGR 109; MARS 250, PHYS 40I; RENR 20I.

2. **Foreign Language** To understand the major cultures of the world as expressed in art, philosophy, politics or economy, it is necessary to know and appreciate languages other than one's native language.

Although not considered for 1997 admission, a year of foreign language and a course in computer science are required as part of a core curriculum to graduate from Texas A&M University. This core curriculum requirement may be satisfied by the satisfactory completion in high school of two units of the same foreign language and by the satisfactory completion of a unit (one full year) of computer science chosen from the following: Computer Mathematics I or II, Business Computer Applications I, Business Computer Programming I, or Data Processing.

Notes:

- a. International students whose native language is not English will not be required to satisfy the Core Curriculum foreign language requirement.
 - b. Students who wish to demonstrate foreign language proficiency without taking acceptable high school or college courses may do so through the existing credit by examination process for the first two college courses in the foreign language. In cases where students wish to demonstrate proficiency in a language not taught at Texas A&M, the following procedures shall apply. The student shall request an examination from the Head of the Department of Modern and Classical Languages at College Station. This department will coordinate the administration of special examinations to demonstrate foreign language proficiency. This will include finding an appropriate examination to test the student's proficiency, informing the student how to arrange to take that examination and certifying the results to the student's advisor. All arrangements shall be made and fees paid by the student.
3. **Speech and Writing Skills** A course used to satisfy this requirement shall have as its primary focus the improvement of student expression in writing and/or speech. This focus on student expression should be demonstrated both in course instruction and assessment. Acceptable forms of student expression may range from creative to technical. This requirement must be satisfied by ENGL 104 (3 hours) and one of the following: ENGL 203, 210, 235, 236, 301, 341; SCOM 203, 243.

4. **Mathematical/Logical Reasoning** (6 hours, at least 3 of which must be in mathematics): It is not possible to understand or participate in the development of knowledge without knowledge of mathematics (the language of science) and logic (the art of critical inquiry). To be selected from any mathematics course except MATH 102, 103, 104, 130, 150, 365, 366; also may select 3 hours from PHIL 240, 341 OR 342.
5. **Science** (8 hours): Knowledge and appreciation of science as a significant human activity, rather than merely a listing of results or collection of data, is acquired only by engaging in the activities of science. Two or more science courses which deal with fundamental principles and in which critical evaluation and analysis of data and processes are required. A minimum of one course shall include a corresponding laboratory. Non-technical courses are specifically excluded. Four hours to be selected from BIOL 113/123; BOTN 10I; CHEM 10I/11I, 103/113; GEOL 10I; PHYS 20I, 218; ZOOL 107. Remaining hours to be selected from above courses and/or AGRO 30I, 405; ANTH 225; BIOL 114/124; CHEM 102/112, 104/114, 106/116, 222/242; FRSC 204; GENE 30I, 310; GEOG 203/213; GEOL 106; HORT 201/202; METR 30I, 304; OCNG 251/252; PHYS 202, 208, 213, 219, 306/307; RENR 205/215; ZOOL 225.
6. **Humanities** (6 hours): Knowledge of our culture and its ideals makes possible both social integration and self-realization. Courses used to satisfy this requirement shall address one of the following subject areas: history, philosophy, literature, the arts, culture or language (exclusive of courses devoted predominantly to acquiring language skills in a student's native language). Acceptable courses are: AGEC 316; ANTH 202, 205, 215, 30I, 302, 303, 306, 307, 308, 313, 315, 316, 350, 351; ARCH 429, 439, 440, 449; ARTS 103, 11I, 112, 149, 150, 205, 208, 212, 350; ENDS 149, 150, 249, 311, 329, 353, 359; ENGL 203, 212, 22I, 222, 227, 228, 23I, 232, 25I, 313, 314, 315, 316, 319, 32I, 322, 323, 334, 335, 336, 337, 338, 340, 345, 346, 350, 35I, 360, 36I, 365, 368, 374, 375, 376, 377, 378, 390, 394, 396, 40I, 410, 412, 414, 43I, 474, 48I; GEOG 202, 30I, 302, 305, 307, 316, 322, 323, 460; HIST (any course); HORT 203; HUMA 21I, 213, 303, 304; LAND 240, 340; IBAR 203, 33I (no more than 3 hours of the humanities requirement may be satisfied by IBAR 33I); LING 307, 410, 45I; MUSC 200, 20I, 31I, 312, 315, 320; MODL (any course from the Department of Modern and Classical Languages, which includes CHIN, CLAS, FREN, GERM, ITAL, JAPN, MODL, RUSS, SPAN); PHIL (any course except 240, 34I, 342); RELS 368; SCOM 30I, 327, 407, 425, 430; THAR 10I, 110, 155, 210, 280, 28I, 380, 407; WMST 368, 374, 46I, 473, 474, 475, 477.
7. **Social Science** (6 hours): As the human social environment becomes more complex, it is increasingly important for individuals to understand the nature and function of their social, political and economic institutions. Courses used to satisfy this requirement shall address one of the following subject areas: anthropology, economics, political science, geography, psychology, sociology or communication. Acceptable courses are: AGEC 105, 350, 429, 430, 452; AGED 340, 440; ANTH 20I, 210, 225, 300, 31I, 314, 402, 403, 404, 410; ECON (any course); ENGL 209, 31I; EPSY 320, 32I; GEOG 20I, 204, 210, 306, 31I, 330, 399, 40I, 439, 440; HORT 335; INST 322; JOUR 102, 30I, 40I, 440; KINE 304, 319; IBAR 204; LING 105, 209, 31I; POLS (any course); PSYC (any course except 203, 204); SCOM 105, 315, 320, 325; SOCI (any course except 220, 420); WMST 300, 316, 317, 404, 424, 462.

8. **Physical Education** (4 hours): Mental development cannot be separated from physical development; a sound mind, as the ancients knew, requires a sound body. To be selected from any KINE 199 course offering.
9. **Citizenship** (12 hours, 6 hours of political science and 6 hours of history): To be a responsible citizen of the world it is necessary, first, to be a responsible citizen of one's own country and community. POLS 206 and 207 and HIST 105 and 106 or other courses in American and Texas history, except that courses pertaining solely to Texas history may not comprise more than 3 hours.

Notes:

1. Individual degree programs may impose more restrictive requirements in any of these areas. Students should consult the Undergraduate Catalog and their academic advisors to ensure that they are satisfying all requirements of their majors.
2. No course shall be counted twice by the same student toward satisfaction of the Core Curriculum requirements. For example, if a student elects to use ENGL 203 to satisfy the speech and writing skills requirement, the student may not use the course to satisfy the humanities requirement. And, University courses taken to satisfy the foreign language requirement cannot also be used to satisfy the humanities requirement.
3. Courses numbered 484, 485, OR 489 do not satisfy Core requirements.
4. No student may satisfy all 12 hours of Core course requirements in the categories of Humanities and Social Science by courses having the same prefix.
5. No student may use the first two semesters of University courses (i.e., "Beginning...") in the same language used to satisfy the Foreign Language requirement to satisfy any part of the Humanities requirement of the Core Curriculum. For example, if a student uses two years of Spanish taken in high school to satisfy the Foreign Language requirement, then the student may not use SPAN 101 OR 102 in satisfying the Humanities requirement.
6. Students transferring to Texas A&M University at Galveston who entered any institution of higher education as new freshmen after the spring semester of 1988 will be placed under the TAMUG catalog that was in effect during the first semester of their freshman year, and they will comply with any Core Curriculum requirements mandated by that catalog. Other transfer students may be placed under Catalog 110 or an earlier catalog, as the student's dean determines is appropriate. Students entering Texas A&M at Galveston under catalogs that do not require compliance with the Core Curriculum do not become subject to it by changing majors. However, all students graduating from Texas A&M after September 1, 1995 must satisfy Core Curriculum requirements.

Admission

Texas A&M University at Galveston has a strong institutional commitment to the principle of diversity in all areas. In that spirit, admission to the University and any of its sponsored programs is open to all qualified individuals. To be admitted, an applicant must meet the admission requirements in effect for the desired term of entry. Texas A&M University at Galveston reserves the right to defer the initial registration of newly admit-

ted applicants if it appears their enrollment for a given semester will exceed the physical capabilities of the TAMUG campus and jeopardize the quality of education offered students to whom the University is already committed.

Applications for admission to Texas A&M University at Galveston should be completed according to the printed directions and addressed to the Office of Admissions and Records, Texas A&M University at Galveston, P.O. Box 1675, Galveston, Texas 77553-1675. Acceptance by the Office of Admissions and Records does not constitute admission to the U.S. Maritime Service License Option Program. (See the section on Admission to the U.S. Maritime Service License Option Cadet Program for information).

When admission requirements have been satisfied, the Office of Admissions and Records will send the applicant a letter of acceptance. The Office of Student Relations will send an acceptance packet and a medical history and immunization form to the student. State law requires that all students enrolled in an institution of higher education present evidence of immunization against diphtheria, tetanus and, if under 19 years of age, poliomyelitis. Students entering or reentering Texas A&M University at Galveston must furnish proof of the required immunization by completing and returning the medical history and immunization form prior to the first day of classes.

Steps in Applying for Admission to Texas A&M University at Galveston

1. **Application for admission:** Write to the TAMUG Student Relations Office, P.O. Box 1675, Galveston, Texas 77553-1675 to obtain an application. Applications are also available at high school/college nights or from high school counselors. An application fee of \$35 should be forwarded with the completed application to the Admissions and Records Office.
2. **Transcripts:** Ask the high school counselor or registrar to forward an official transcript to the Office of Admissions and Records. This transcript must reflect grades complete through six semesters of high school work. The transcript should also reflect the rank in class and the list of courses which will be completed during the senior year. Transfer applicants and freshman applicants who have graduated from high school at the time of application should submit an official transcript that includes class rank and date of graduation. To be considered official, a transcript must bear an original signature of a school official and/or the school seal and be received directly from the institution. Fax copies are not official.
3. **Testing:** Arrange through the high school counselor to take the Scholastic Aptitude Test (SAT) or the American College Test (ACT). The English Composition Achievement Test and Mathematics Achievement Test of the College Board (CB) are highly recommended but not required. Designate the scores to be sent to TAMUG (Code 6835 for SAT and Code 6592 for ACT) by the testing agency. It is recommended that the tests be scheduled in the latter part of the junior year or early part of the senior year. The achievement tests are used for counseling and placement purposes and should be taken by January of the senior year. Paper reports not coded for TAMUG or recorded on high school transcripts are not acceptable as official scores. Students are admitted on the basis of specified courses taken in high school, class rank and SAT or ACT scores.

When to Apply

Those who meet the admission standards will be admitted until the last day for enrollment during the semester requested. All application credentials should preferably be received by March 1 for the fall term. International students must meet the deadlines specified in the International Admission section of this catalog.

There are two major periods when high school students may apply for admission to Texas A&M University at Galveston. One is for students who are eligible for priority admission and the other for students who do not meet those requirements (see information below).

Freshman Admission

To be admitted to Texas A&M University at Galveston the applicant must be graduated from a properly accredited secondary school. In addition, the applicant must have satisfactorily completed certain high school subjects and must have made an acceptable score on the Scholastic Aptitude Test (SAT) or on the American College Test (ACT). Those students who qualify for admission in all respects with the exception of having achieved the minimum score on the SAT or ACT may qualify for Provisional Admission.

Required High School Credits

The unit requirements for admission to the University are designed to insure adequate preparation for the various curricula offered by the University.

The 16 acceptable entrance credits which a student should have for admission (with exceptions indicated where applicable) are as follows:

Subject	Units	Remarks
English	4	These units must include English I, II, III, and IV. College Board Advanced Placement English Literature or Literature and Composition can be substituted for English IV.
Social Science	3	U.S. History, U.S. Government, World History, World Geography, Economics or a State History.
Mathematics	3.5	Algebra I, Algebra II and Geometry. One-half unit of Trigonometry, Precalculus, Calculus, Probability and Statistics, Number Theory or Linear Algebra is required.
Science	2	Two units must be selected from Biology, Chemistry or Physics. A third year is strongly recommended. <i>For 1998 and later admissions, three years of Science will be required.</i>

Foreign Language	2	Foreign language is required to graduate from Texas A&M. This requirement can be satisfied by the completion in high school of two units of the same foreign language. This includes American Sign Language.
Computer Science	1	Although not required for admission, a course in computer science is required to graduate from Texas A&M. This requirement can be satisfied by the completion in a Texas high school of a course chosen from the following: Computer Mathematics I or II, Business Data Processing, Introduction to Computer Programming, Computer Programming, Microcomputer Applications, Business Computer Applications I or II, Computer Science I or II or Business Computer Programming I or Data Processing. Similar courses taken elsewhere also will apply.

Tests Required of New Students

Texas A&M University at Galveston requires the Scholastic Aptitude Test (SAT) or American College Testing Program (ACT) test as a part of its admission procedures for all freshman applicants and transfer students with less than 31 graded hours. The English Composition Achievement Test and Mathematics Achievement Test (Level I or II) are also recommended but not required. When registering for these tests, students should designate that the results be sent to Texas A&M University at Galveston (Code 6835 for SAT and Code 6592 for ACT). Test scores will not be accepted unless furnished directly to Texas A&M University at Galveston or Texas A&M University in College Station by the College Board or the American College Testing Program.

The University will accept scores on either Mathematics Test: Level I or Level II. However, most students are expected to take the Mathematics Test, Level I. Students interested in taking the Mathematics Test, Level II, should do so only after careful study of the College Board Publication, Achievement Tests, and a conference with a high school counselor or mathematics teacher. SAT scores were recentered in 1995. Data published in this publication, unless specifically noted, refers to recentered test scores, i.e., those tests taken after April 1, 1995.

Priority Admission

Applicants with complete applications on file by March 1 for the summer session and/or fall semester (November 1 for spring) who present the academic credentials required for priority admission are admitted as soon as possible. Priority admission requirements are stated in terms of a combination of required high school courses, class rank and minimum performance on the SAT (verbal and math) or ACT (composite):

If an applicant's rank in the high school class is:		Then the minimum test score for priority admission is:			
SAT		ACT			
	Verbal	Math	English	Math	Composite
Top 10%	520	550	22	24	23
1st Quarter	530	560	23	24	24

Regular Admission

Applicants with complete applications on file by March 1 who do not meet the priority admission criteria but do have the following qualifications will have their complete applications reviewed.

If an applicant's rank in the high school class is:	Then the minimum test score for regular admission is:	
	SAT	ACT
Top 10%	No Minimum	
1st Quarter	920	19
2nd Quarter	1,050	23
3rd and 4th Quarters	1,180	27

Because the number of persons who can be admitted through this review depends on the number admitted through priority admission, this review will be completed after March 1 (November 1 for spring). Although we cannot guarantee admission to applicants in this category, we have been able to accommodate all who had applied and qualified by March 1 over the past several years. If the number of applicants is too large to allow for the admission of all who have these minimum credentials, those who present the best combination of academic qualifications and other attributes will be admitted.

Texas Academic Skills Program (TASP)

All students with no previous college credit entering public colleges and universities in Texas in fall 1989 or thereafter must demonstrate competency in reading, writing, and mathematics by passing standardized TASP examinations. Students with failing scores will be required to complete remedial work prior to being allowed to enroll in designated

university courses. The hours for these courses will not count toward any degree program. New students reporting to the University without TASP scores must successfully complete the examinations at a test site and date to be announced. Failure to complete the examinations will preclude a student's eligibility to enroll for the following semester if enrolling will take the student beyond nine credit hours. Once a student has accumulated 60 semester credit hours or the equivalent, the student cannot enroll in upper-division courses until all three sections of the test have been passed. Students who have accumulated fewer than 60 semester credit hours may enroll in upper-division courses upon the advice of their college even though they may not have passed the TASP tests. Note, any student who has earned a minimum of three academic credit hours from Texas A&M University at Galveston or three academic credit hours accepted as transfer credit at Texas A&M University at Galveston prior to September 1, 1989 will be exempted from the TASP requirements. Exemption may also be granted for exceptional scores on the TAAS, SAT, or ACT examination. Further information may be obtained from the TAMUG Office of Admissions and Records Department.

Provisional Program

This program is for those high school graduates who have never attended college and who meet all admissions criteria except the minimum score on the SAT or ACT. A limited number of freshmen applicants who are not admitted through the priority or regular admissions procedures, but whose academic background suggests a possibility of success, may be offered admissions through the Summer Provisional Program. If too many applicants request this option, those with the most promising previous academic performance combined with the most desirable additional credentials will be offered this option. To assure consideration for this program, prospective students should complete the application process by March 1. Admitted students will contract with the University to maintain satisfactory academic progress. This program requires attendance on campus at TAMUG, the provisional program is not available for Summer School at Sea.

Transfer Admission

Admission may be granted to undergraduate students who have begun their work at other colleges or universities, have also satisfied the requirements as set forth below. A transfer student is deemed as one who has registered at another college or university. An applicant may not disregard the academic record of any previous education received at another institution. Transfer applicants are encouraged to submit an official high school transcript.

An applicant must be eligible to return to the institution from which the transfer is sought.

Applicants seeking admission to the license-option curricula who have attended another maritime academy or college must provide a letter to the Superintendent of the Texas Maritime Training Program from the Superintendent of the other academy or college verifying that the student is eligible to return to that institution. Applicants must also submit a formal application for admission as well as two official transcripts of their record at each college or university previously attended and two official high school transcripts as early as possible. This material should be sent to the Office of Admissions and Records,

Texas A&M University at Galveston, P.O. Box 1675, Galveston, Texas 77553-1675. The applicant must have achieved an overall grade point ratio of 2.25 or better on the work attempted and must meet or surpass this same standard for each of the last two semesters of attendance, if in attendance two or more semesters. A 10-week summer session with a normal load of course work will be considered a full semester. To assist preparation for admission and enrollment at Texas A&M, the following foundation course pattern has been developed. Texas A&M course equivalencies to the Texas Common Course Numbering System (TCCN) may be requested from the Admissions and Records Office.

The number of hours and the grades earned on transferable courses in the foundation are the primary criteria used to make transfer admissions decisions. Priority will be given to students with a minimum of 30 semester credit hours. However, applicants with a minimum of 18 semester credit hours will be considered.

Suggested Foundation Courses

	Hours	Chosen Degree Program
ENGL 104	3	
HIST 105 & 106	6	
POLS 206 & 207	6	
MATH 151	4	
BIOL 113, 123, 114, & 124	8	MARB, MARF, MARA, or MARS majors
CHEM 101, 111, 102, & 112	8	MART, MASE, or MARE majors
Humanities Electives	6	Refer to your degree listing for options
Social Science Electives	6	Refer to your degree listing for options

Marine Biology, Marine Biology with License Option and Marine Fisheries Transfer Applicants:

To transfer into or change their major to Marine Biology, Marine Biology with License Option or Marine Fisheries, students must have a minimum of 30 transferable semester credit hours with a cumulative 2.75 GPR or better and a 2.75 GPR or better in each of the last two semesters of attendance.

A student who has fewer than 30 semester hours of transferable credit must meet the admission requirements for entering freshman as well as the 2.75 standard indicated above. The high school record, college record, and test results will be used to determine admission status. The results of either the Scholastic Aptitude Test or the American College Testing Program will be accepted in determining eligibility for admission of a transfer student.

On the basis of the credentials submitted, credit will be given for work completed satisfactorily at another properly accredited college or university as long as the work is equivalent in character and extent to similar work at Texas A&M University at Galveston or Texas A&M University. Credits given by transfer are provisional and may be canceled at any time if the student's work at the University is unsatisfactory. See the section entitled "Transfer of Credits" for additional information. Students will be classed by the number of credits transferred. Depending on the number of transferred credits used in the student's degree plan, a student could be classed as a senior but be a curriculum sophomore.

Transfer students should read carefully the section of this catalog entitled "Requirements for a Baccalaureate Degree," particularly the portion which explains residency requirements.

Courses in a subject area which are more elementary than the beginning required courses in that same subject area of a student's chosen curriculum at this University will not apply toward satisfying the degree requirements of that curriculum.

International Admission

If space is available, international students (non-U.S. citizens) with superior academic records will be considered for admission to Texas A&M University at Galveston through the International Admissions Office of Texas A&M University (College Station). For information about application deadlines, admissions criteria, expenses, and English language proficiency, international students should request an application and a copy of the brochure "Information for Prospective International Students," from the Office of Admissions, Texas A&M University, College Station, Texas 77843-0100, USA.

The deadlines for admission are February 1 for the fall semester and the summer session and September 1 for the spring semester.

Steps in Applying for International Admission to Texas A&M University at Galveston

- Application for Admission:** Write to the Office of Admissions, Texas A&M University, College Station, Texas 77843-0100, USA, to obtain an international student application and information brochure.
- Testing:** All international students must take the Test of English as Foreign Language (TOEFL). Information about the test may be obtained by writing to TOEFL, Box 899, Princeton, New Jersey 08540, USA. International applicants are encouraged to take the Scholastic Aptitude Test or the American College Test (required for graduates of U.S. high schools). Test results must be sent directly to TAMUG or TAMU by the testing agency (SAT and TOEFL code is 6835, ACT code is 6592).

All students whose native language is not English are also required to take a rigorous oral and written examination prior to the semester of entry. These examinations are given at Texas A&M University, College Station. On the basis of this examination and other English proficiency information, students will be assigned to a:

- full-time University program, or
- part-time University program and a part-time English program in the English Language Institute (ELI), or
- full-time English program in the English Language Institute.

Students who are required to attend courses in the English Language Institute on the College Station campus will take additional time to complete a degree.

3. **Transcripts:** Submit official academic records along with the certified English translations if the original documents are not in English. Secondary school records must show completion of a college preparatory curriculum. Applicants who have attended another college or university must submit these records in addition to secondary school records. All applicants must have a B average or better to be considered for admission.
4. **Finances:** Texas A&M University at Galveston does not have scholarship funds available for international students. The U.S. Immigration and Naturalization Service requires international students to furnish proof of sufficient financial resources in U.S. dollars. If accepted for admission, international students are required to make an advance deposit toward their first semester expenses.

Readmission of Students

Any former student who has resigned, been dropped from the rolls, or has not attended Texas A&M University at Galveston or Texas A&M University for at least one full semester must complete an Application for Readmission and submit it to the Office of Admissions and Records at Galveston as early as possible. If the student has attended any other institutions since last enrolled at Texas A&M University at Galveston or Texas A&M University, then two official transcripts from each institution attended should be submitted at the time of reapplication.

Applicants must have achieved an overall GPR of 2.0 (C average) or better on the work attempted and must have at least a 2.0 GPR (2.75 GPR for MARB, MARB/LO or MARF majors) for each of the two most recent semesters in attendance, if in attendance two or more semesters.

Readmission to the University does not constitute readmission to the U.S. Maritime Service License Option Program. Students returning to the University who wish to enter or reenter the Corps of Cadets as a license-option student must apply for admission to the Corps of Cadets through the Superintendent's Office.

Admission of Students Not Declaring a Major

Freshmen and transfer students who are not yet ready to choose a major field of study, or students who have decided to discontinue pursuit of a previously declared curriculum are temporarily assigned to the Department of General Academics. Advisors in the Department of General Academics help such students devise schedules that permit sampling of courses in several subjects to help them choose the most appropriate major field of study. At the same time, students satisfy common basic requirements in as many curricula as possible within the scope of their general interest.

Most students declare a major within one academic year after assignment to the department of General Academics. All students enrolled in General Academics must identify their major by the time they have completed 60 semester hours of courses.

A sample first semester course schedule for a General Academics freshman student follows:

Sample First Semester Schedule

ENGL 104 Composition and Rhetoric (3-0)	3
HIST 105 History of the U.S. (3-0) and/or	
POLS 206 American National Government (3-0)	3-6
Mathematics*	3-4
Physical or Biological Science*	3-4
Elective*	3-4
MARS 101 Introduction to Marine Science*	1
KINE 199 Required Physical Activity	1

12-19 hours**

*To be selected in consultation with faculty advisor on the basis of the student's background, interests, and goals.

**The total number of credit hours may vary depending on the student's choice of courses after consulting with an advisor. Most first semester students are encouraged to take 12-15 hours.

Registration

Registration for the fall and spring semesters is accomplished at two times. In the preceding fall or spring semester, a preregistration period is held for currently enrolled students to register for the next semester.

During the week before classes begin for a particular semester, there is a delayed registration period for all those students who have not already registered. Summer school registration is the day before classes begin each summer term and the 10-week semester. Further information concerning registration may be obtained from the academic calendar published in this catalog or from the Office of Admissions and Records. Schedules of classes are available at the Office of Admissions and Records shortly before registration periods.

Academic Advising

Academic advising is coordinated and supervised by the department heads during orientation. Students majoring in curricula offered by the department can ordinarily obtain counseling concerning academic program planning and curriculum-related matters from department faculty members who serve as academic advisors. If there are special problems, the department head, the Associate Campus Dean for Academic and Administrative Services, or the Campus Dean may be consulted.

Within the degree programs, students may pursue individual career interests through selection of courses with the assistance of departmental advisors.

Credit by Examination

Students at TAMUG may earn course credits by demonstrating superior achievement on tests offered by several examination programs. Credit by examination is available both

to freshmen who plan to enter the University and to students who are currently enrolled. TAMUG awards credit for scores on certain tests published by Advanced Placement Program (AP), the College Level Examination Program (CLEP), the College Board (CB) Achievement Tests, and the International Baccalaureate Higher Level Examinations. TAMUG awards qualified students opportunities to earn credits by taking departmental challenge examinations prepared by the faculty. Information concerning credit by examination may be obtained from the Campus Director of Counseling.

Entering freshmen may take examinations for credit during the new student orientation conferences. This must be scheduled with the Campus Director of Counseling at least four weeks prior to orientation.

Policies for the Transfer of Undergraduate Course Credit

The Texas Common Course Numbering System (TCCNS): Many colleges and universities in Texas have agreed to use the TCCNS. Texas A&M University has identified equivalent courses and has included the TCCNS in the TAMU and TAMUG course descriptions.

The transfer of course credit will be determined by the Office of Admissions and Records on a course-by-course basis. Credit submitted for transfer must be on an official transcript received by the Office of Admissions and Records from the registrar of the institution where the credit was earned. Course content will be determined from the catalog description or the syllabus. The transfer of credit decision will be based on the following criteria. All criteria are to be considered together; for example, criterion 10 may be qualified by criterion 7.

Credit from Institutions Accredited by One of the Regional Accrediting Associations:

1. A course that is normally considered as part of a bachelor's degree program (not including the bachelor of technology or similar terminal degree) will be transferred. The following criteria, taken together, are used:
 - a. The course is applicable to a bachelor's degree at TAMUG.
 - b. The course is similar to those offered for degree credit by TAMUG.
 - c. The course content is at or above the level of the beginning course in the subject matter offered by TAMUG.
2. A course that is intended for use in a vocational, technical, or occupational program will normally not transfer. In certain cases, credit for occupational skill courses will be considered. Transfer of this credit requires that the student major in engineering technology or industrial distribution at TAMU–College Station. Also, the department head and dean must approve the course for use in the student's degree program.
3. Credit for support courses such as MATH, science, and English intended specifically for use in an occupational program will not be transferred.
4. Credit for the course must be shown on the official transcript in semester hours or in units that are readily converted to semester hours.

5. A graduate level course will not be transferred for undergraduate credit unless approved for use in the student's undergraduate degree program by the student's major department and dean. This also applies for a course offered in a professional degree program such as nursing, law, or medicine.
6. Credit by examination awarded by the sending institution will be transferred providing the student received credit for a specific transferable course or courses at the institution, and the credit by exam is shown on an official transcript by course number.
7. A course similar to one offered by the Colleges of Agriculture and Life Sciences, Business Administration, Geosciences and Maritime Studies, or Engineering at the junior or senior level will be transferred by title only. Such courses may be used in the student's degree program only if approved by the department head and dean of the student's major field. Validation of such credit, either by examination or the completion of a higher-level course, may be required.
8. A field experience, internship, or student teaching course will be transferred by title only. Since an internship is considered to be the capstone of a professional curriculum, such credit will not be transferred from a two-year college.
9. Credit for cooperative education will not be transferred.
10. A course that is essentially equivalent to a Texas A&M University at Galveston course will be transferred as an equivalent course. An essentially equivalent course covers at least the same material, requires the same prerequisites and receives at least the same semester hour credit as the TAMUG course. Two or more courses may be combined to form one or more equivalent courses. If there is any doubt about the equivalency of a course, the TAMUG or TAMU department offering the course subject matter will be asked to determine if the course is equivalent.
11. A student pursuing a bachelor's degree at Texas A&M at Galveston may transfer from two-year colleges a maximum number of hours not to exceed six more than the number required through the freshman and sophomore years of his or her chosen curriculum at TAMUG, generally 66 semester credits.
12. In any case where a decision cannot be made using the above criteria, the Office of Admissions and Records will determine the transfer of credit based on University policy, previous action of the University and prior experience.

Resolution of Transfer Disputes for Lower-Division Courses:

The transfer curricula shall be as prescribed by the current issue of the Coordinating Board's guide to transfer curricula and transfer of credit. The following procedures shall be followed by Texas Public Institutions of Higher Education in the resolution of transfer disputes involving lower division courses:

1. If an institution of higher education does not accept course credit earned by a student at another institution of higher education, that institution shall give written notice to the student and the other institution that the transfer of the course credit is denied.
2. The two institutions and the student shall attempt to resolve the transfer of the course credit in accordance with Board rules and/or guidelines.

3. If the transfer dispute is not resolved to the satisfaction of the student or the institution at which the credit was earned within 45 days after the date the student received written notice of the denial, the institution that denies the transfer of the course credit shall notify the Commissioner of its denial and the reason for the denial.

The Commissioner of Higher Education or the Commissioner's designee shall make the final determination about a dispute concerning the transfer of course credit and give written notice of the determination to the involved student and institutions.

Credit from Nonaccredited Schools:

Students who transfer to Texas A&M University at Galveston from an institution of higher education that is not accredited by one of the regional accrediting associations may validate the work taken at the institution by one of the following methods:

1. Successful completion of a comprehensive departmental examination or nationally standardized examination that is approved by the department.
2. Successful completion of a higher-level course in the same subject area when approved by the head of the department and the dean of the college.

Credit will be given to students transferring from nonaccredited public colleges in Texas for work completed with grades of C or better if they earn a grade point of 2.0 (C average) on the first 30 hours of residence work at this University.

Credit from International Schools:

Transfer work from international colleges and universities will be evaluated on an individual basis. No English course credit will be awarded for courses completed in non-English speaking countries. "A" level examinations will transfer. Baccalaureate II examinations will not transfer, however, these students may take CLEP or departmental examinations to receive credit.

Correspondence Courses:

Students may apply up to 12 hours of correspondence credit earned through an accredited institution toward the requirements for an undergraduate degree, even though Texas A&M University at Galveston does not offer courses by correspondence.

Correspondence courses taken through the Defense Activity for Non-Traditional Education Support (DANTES) may be accepted and included in the 12 hours allowed. Students may apply a maximum total of 30 semester hours of approved extension class work and correspondence study toward a degree.

In order for a student in residence at Texas A&M University at Galveston to receive credit for correspondence work toward a bachelor's degree, he/she should:

1. Obtain advance written permission from the dean of his or her college.
2. Present appropriate evidence (official transcript) of having completed the course.

Academic Credit for Military Service:

Students who have completed one year of active duty in the armed forces of the United States may be given academic credit of four semester hours of Military Science.

Students who have served at least one year in the armed forces of the United States on active duty as commissioned officers may be given academic credit of 16 semester hours of Military Science.

A student wishing to receive such credit should file a certified copy of his or her DD-214 with the Office of Admissions and Records so that credit may be allowed. This credit will not exempt a student from TASP.

Concurrent Enrollment at TAMUG and Other Colleges and Universities

A student enrolled at TAMUG who wishes to take a course or courses concurrently at another institution for degree credit at Texas A&M University at Galveston must receive the prior approval of the appropriate department head.

Academic Rules and Regulations

A handbook entitled *Texas A&M University at Galveston University Regulations* is prepared each year for the benefit of the student body. Because it is published at the beginning of the academic year, Texas A&M University at Galveston University Regulations (including periodic revisions) is the governing document in case of conflict between this catalog and the Regulations. It is the responsibility of each individual student to read this handbook carefully and to use it as a ready reference. Copies are available through most departments and the Office of Student Affairs.

Students applying for admission to Texas A&M University at Galveston are required to submit transcripts of previous academic work and in some cases, results of standardized tests. The submission of altered documents or the failure to furnish complete and accurate information on admission forms will be grounds for disciplinary action.

The buying, selling, creating, duplication, altering, giving or fraudulently obtaining the Texas A&M University diploma or other academic record is prohibited by state law. A person who violates this statute or who aids another person in violation is guilty of a misdemeanor and is subject to a fine and/or confinement if convicted.

The University has the right to rescind a previously granted degree if the University becomes aware of information indicating that the degree never should have been granted.

Students are required to take the courses listed in a curriculum; however, the display of a curriculum does not in any way indicate the length of time required to finish degree requirements. Rather, this display is intended as a guide to indicate the preferred order for completion of degree requirements. Exceptions to certain requirements may be petitioned through the department head to the Campus Dean.

Grading System

Since students attend a college or university to extend their education, grades are usually taken as an indication of the proficiency of their endeavors. The student's semes-

ter grade in a course shall be based upon performance and/or participation in class, exercises and tests, laboratory work and final examination as applicable to the course. The proportionate weight assigned to each of the factors shall be determined by the department administering the course.

The basis upon which the final grade will be determined shall be distributed in written form to the class during the first two weeks of a semester and during the first week of a summer term.

There are five passing grades at the undergraduate level, A, B, C, D, and S, representing varying degrees of achievement; these letters carry grade points and significance as follows:

A	Excellent, 4 grade points per semester hour
B	Good, 3 grade points per semester hour
C	Satisfactory, 2 grade points per semester hour
D	Passing, 1 grade point per semester hour
F	Failing, no grade point (hours included in GPR)
I	Incomplete, no grade points (hours not included in GPR)
Q	Dropped course with no penalty
S	Satisfactory (C or above), hours not included in GPR
U	Unsatisfactory (D or F), no grade points (hours included in GPR)
X	No grade submitted (hours not included in GPR)
WP	Withdrew passing (A-D), hours not included in GPR
WF	Withdrew failing (F), hours included in GPR
NG	No grade. Course dropped, no penalty. Requires a dean's permission, hours not included in GPR.
F, WF, U	Failing grades, indicating work of unsatisfactory quality.

Incomplete

The temporary grade I (Incomplete) at the end of a semester or summer term indicates that the student has satisfactorily completed the course with the exception of a major quiz, final examination or other work. This grade is given only when the deficiency is due to authorized absence or other cause beyond the control of the student and when the work already done has been of quality acceptable for the satisfactory completion of the course. Incomplete work must be completed before the end of the next fall or spring semester in the University unless the student's dean grants an extension of time for good reason. If the incomplete work is not completed within this time or if the student registers for the same course again, the I will be changed to an F by the registrar, and the student must repeat the course to receive credit for it.

Drop/Add

A student may drop courses during the first five class days of a fall or spring semester and during the first three class days of a summer term or a 10-week summer term. A student may add courses during the first seven class days of a fall or spring semester and

during the first four class days of a summer term or a 10-week summer term.

Refunds or supplemental billings will be made for courses dropped or added during these times. Notices of refunds due or amounts owed will be mailed to the student's local address.

Q-Drop

After the fifth class day of a fall or spring semester or the third class day of a summer term or 10-week summer term, with the approval of the department head of a student's major, a student may drop a course through the 50th class day of a fall or spring semester, the 14th class day of a summer term, or the 35th day of a 10-week summer term. The symbol Q shall be given to indicate a drop without penalty. A student who drops a course after the Q-drop deadline will receive a grade of F unless unusual circumstances exist as determined by his or her dean. Students are permitted three (3) Q-Drops during their academic careers.

Satisfactory/Unsatisfactory

Undergraduate students classified as juniors or seniors with minimum overall grade point ratio of 2.5, based on at least 30 hours of credit at Texas A&M University at Galveston, may be permitted to take a total of 12 credit hours of electives during their academic careers at Texas A&M University at Galveston on a satisfactory/unsatisfactory basis as a part of the hours required for their degrees. Only undirected electives may be taken on an S/U basis. Students wanting to take a course on satisfactory/unsatisfactory basis must register on this basis during the official registration period. Students shall not be permitted to change the basis on which their grades will be recorded on their official records.

The hours for which a student receives a grade of Satisfactory (C or above) shall not be included in the computation of the student's semester or cumulative grade point ratio; a grade of Unsatisfactory (D or F) shall be included in the computation of the student's grade point ratio at 0.0 grade points per credit hour. The hours taken on a satisfactory/unsatisfactory basis will not be included in the 15 hours required for the designation of Distinguished Student.

Students who transfer to Texas A&M University at Galveston must have earned at least 12 hours of credit at Texas A&M University at Galveston before taking a course on a satisfactory/unsatisfactory basis with exception of Physical Education courses.

A student must have the written approval of his or her academic advisor or department head in order to take a course on a satisfactory/unsatisfactory basis.

Colleges may refuse to accept work taken on a satisfactory/unsatisfactory basis for courses requiring a prior in-depth knowledge of the subject matter.

Withdrawal from the University

Students desiring to withdraw from the University before the end of a semester or summer term are required to complete the official withdrawal form. Assistance in obtaining such clearance is provided by the Admissions and Records Office. Students who withdraw during the first five days of fall or spring semester or the first three days of a summer term receive no record on their permanent record. After the fifth class day of fall or spring

semester or the third class day of summer terms, students who withdraw from the University receive grades of WP or WF. WF grades shall be taken into account in determining the GPR. Students may not withdraw during final exam periods.

Repetition of a Course to Improve Grade

Any undergraduate student who wishes to repeat a course must do so before he or she completes a more advanced course in the same subject. What constitutes a more advanced course will be determined by the head of the department offering the course.

Credit in a course failed may be obtained only by registering and repeating the course in class. The original grade will remain on the student's permanent record, and both grades will be used in computing the GPR. An F or U previously made is not removed once the course is passed. Credit for each repeated course may only be used once toward degree requirements.

A student repeating a course in which a grade of B or better has been earned will not receive grade points for the repeated course, unless the catalog states the course may be repeated for credit.

Semester Credit Hour

A lecture course which meets one hour per week or 15 hours per semester or summer term is assigned a value of one semester credit hour. Thus, a course worth three semester credit hours, meets for three hours per week or 45 hours per semester or summer term. Credit hours for laboratory courses are determined to be some fraction of the number of hours spent in class, usually one third.

Only the record made in course work for which the student was registered in this institution or TAMU shall be used in determining grade point ratio. A student's grade point ratio for any given period is computed by dividing the total number of semester hours for which grades were received into the total number of grade points earned in that period. Grades of WF, U, and F are included, but grades of WP, S, Q, X, I, and NG are excluded.

Grade Reports

Preliminary Report: Preliminary reports of the student's current progress are available to students in the Admissions and Records Office near the middle of each semester. The preliminary report does not become a part of the student's permanent record.

Semester Report: An official report will be available to students at the close of each semester. Students should check the schedule booklet for instructions to access the Tele-grade system.

Scholastic Probation

Whenever a student's cumulative record indicates that he or she is failing to make satisfactory progress, the student is considered scholastically deficient. The cause of the deficiency will be investigated by the Associate Campus Dean for Academic and Administrative Services, and the student may be placed on scholastic probation for such terms as

the dean shall designate, or the student may be required to withdraw from the University if the deficiency so warrants.

Scholastic probation is a conditional permission for a student to continue in the University after he or she has become scholastically deficient. This permission is granted by the Associate Campus Dean for Academic and Administrative Services or the Campus Dean when an analysis of the deficiency indicates that a continuation is in the best interest of the student and the University. The Associate Campus Dean for Academic and Administrative Services also reviews the records of all students on scholastic probation.

Distinguished Student and Dean's Honor Roll

A student who completes a semester schedule of at least 15 hours or a summer session schedule of at least 12 hours with no grade lower than C and with a grade point ratio of at least 3.25 for the semester or a summer session shall be designated as a Distinguished Student. A student who under the same circumstances, achieves a grade point ratio of 3.75 or higher will, in addition, be designated as a member of the Dean's Honor Roll. Official notifications of the designations are issued to the student by the Associate Campus Dean for Academic and Administrative Services.

Classification

A student is classified by the number of semester hours posted to the official transcript.

Freshman	1-30	semester hours
Sophomore	31-60	semester hours
Junior	61-95	semester hours
Senior	96+	semester hours

Full-time Student

A full-time undergraduate student is deemed as one who is registered for 12 or more semester hours during a fall or spring semester, 6 hours or more in a summer term, and 12 hours in a 10-week summer semester. A license-option student registered for NAUT 200, 300, OR 400 or MARE 200, 300, OR 400 will be considered a full-time student.

Maximum Schedule

A student with an overall grade point ratio of 3.0 or better may register for a course load in excess of 19 hours in a fall or spring semester or six hours (seven if part is laboratory) in a summer term with the approval of his or her advisor. A student with an overall grade point ratio of less than 3.0 must obtain approval of the Associate Campus Dean for Academic and Administrative Services before registering for a course load in excess of 19 hours in a fall or spring semester or six hours (seven if part is laboratory) in a summer term.

Transcripts

Individuals who have attended the University may obtain an official transcript of their completed work, provided they have no financial obligations to the University. A fee, which according to state law must be paid in advance, will be charged for each copy. Transcripts will not be prepared during the final examination period for students currently enrolled. Students and former students may request transcripts in writing at the Admissions and Records Office or contact the transcript office at TAMU. All transcripts are prepared at TAMU College Station for students at both campuses. No transcripts are issued at TAMUG.

Degree Information

Texas A&M University at Galveston reserves the right to modify the curricula or withdraw any courses therefrom when it appears appropriate to do so. The policies and procedures in this catalog are currently in effect; however, the University reserves the right to make changes or modifications for good cause. Texas A&M University has the right to rescind a previously granted degree if it becomes aware of information indicating that the degree never should have been granted.

Which catalog to follow: In meeting the requirements for a baccalaureate degree, a student is normally expected to complete the course and hour requirements as outlined in the catalog in effect at the time of his or her entrance. For the student who transfers to Texas A&M University at Galveston or who changes his or her degree objectives during his or her course of study, the degree requirements in the catalog specified by the Campus Dean at the time the student makes the transfer or change will be applicable. The baccalaureate degree requirements for a graduating student who first enrolled more than seven years prior to the time of graduation will be established by his or her dean.

The following degrees are offered by the Texas A&M University for the satisfactory completion of resident study in the appropriate curriculum at Texas A&M University at Galveston College of Geosciences and Maritime Studies.

- Bachelor of Science with a major in Marine Biology
- Bachelor of Science with a major in Marine Engineering Technology
- Bachelor of Science with a major in Marine Fisheries
- Bachelor of Science with a major in Marine Sciences
- Bachelor of Science with a major in Marine Transportation
- Bachelor of Science with a major in Maritime Administration
- Bachelor of Science with a major in Maritime Systems Engineering

Requirements for a Baccalaureate Degree

The diploma of Texas A&M University, with the appropriate degree, will be granted to the student who has made formal application for the undergraduate degree and has satisfied the following requirements:

1. The student must complete, with at least a C average (2.00 GPR), one of the regular curricula of study leading to a degree.

2. A curriculum leading to a baccalaureate degree shall contain a minimum of 128 credit hours.
3. The total number of grade points earned at this institution in courses must be at least twice the number of hours which the student carried in courses at this institution. Marine Biology, Marine Biology with License Option, and Marine Fisheries majors must make a C or higher in BIOL 113, 114, 123, and 124 taken at TAMU, TAMUG or transferred and substituted for courses in the degree plan curriculum. Grades of F or WF shall be included, grades of WP and Q shall be excluded.
4. The total number of grade points earned at Texas A&M University at Galveston in courses in the major department must be at least twice the number of hours which were carried at the institution in the major department.
5. Grades made in courses elected in excess of a student's degree requirements shall be counted, but if failing, such courses need not be repeated.
6. The student must be formally recommended for graduation after consideration of his or her completed record.
7. The student must have settled all financial obligations to the University.
8. The student must satisfy core curriculum requirements.
9. All students graduating in the license-option programs must pass their respective Coast Guard examination.
10. The student must have all grades on record in the Admissions and Records Office not later than 12 p.m. on the Thursday preceding commencement for the fall and spring semesters and 5 p.m. on the Thursday preceding commencement during the summer to receive his/her diploma at commencement.

These requirements must be completed and all grades must be recorded in the Registrar's Office of Texas A&M University not later than 5 p.m. on Thursday preceding Commencement Day. This includes all grades pertaining to graduation with honors.
11. Students who have not cleared incomplete grades or filed official transcripts for transfer credit taken the last semester have until the fifth class day of the next term to complete these requirements. If this deadline is missed, the diploma will be destroyed and the student must reapply for graduation.

Residence Requirement

A candidate for a baccalaureate degree at Texas A&M University at Galveston must successfully complete a minimum of 36 semester hours of 300- and/or 400-level course work in residence at Texas A&M University at Galveston or College Station to obtain the degree. A minimum of 12 of these semester hours must be in the major. Candidates for license-option curricula must complete the last two years of the minimum three-year training requirement at Texas A&M University at Galveston and participate in the Corps of Cadets. Students enrolled in a license-option curriculum are required to participate in the Corps of Cadets every semester they are registered. Generally this will be eight regular semesters and three summer cruises. To fulfill degree requirements for graduation that semester, transfer courses taken during a student's final semester must be completed and

cited on an official transcript in the Admissions and Records Office by 12 p.m. Thursday preceding commencement. Students who have attended a public two-year institution in Texas may refer to the appropriate equivalency sheet for the Texas Common Course Numbers for transferability of courses.

Requirement in Political Science (Government) and History

In order to meet the legal requirements for a baccalaureate degree, all students must have at least six credit hours in Political Science (Government) and at least six credit hours in American History as described in detail in the following paragraphs.

Political Science (Government): A student must have credit for six semester hours or its equivalent. Three of the six semester hours are to be Political Science 206 (American National Government) and three semester hours of Political Science 207 (State and Local Government with emphasis on that of Texas). This requirement may also be met, in whole or in part, by equivalent course work satisfactorily completed at another accredited college or university.

Three of the six semester hour requirement may be satisfied if the student meets the requirements to receive credit by examination on the basis of acceptable performance on an advance placement examination or a comprehensive examination.

American History: A student must have credit for six semester hours or its equivalent. Three of the six semester hours may be in Texas History and three semester hours in American History, or the entire six hours may be in American History. This requirement may also be met, in whole or in part, by equivalent course work satisfactorily completed at another accredited college or university.

No more than three hours of the six semester hour requirement may be satisfied on the basis of acceptable performance on an advanced placement examination or a comprehensive examination.

Application for a Degree

Formal application for degrees must be submitted to the Admissions and Records Office, on forms provided for that purpose, in the first week of the semester or summer term in which the student expects to complete requirements for graduation. To obtain the necessary forms, the student must pay a diploma fee in the Fiscal Office and present the fee receipt to the Admissions and Records Office.

In order to be a candidate for a degree at the end of a semester or summer term, a student at the beginning of that semester or term must be registered for the courses necessary to complete the requirements of the curriculum.

Double Major

Students may elect to double major, that is, pursue two major fields of study, if both lead to the same baccalaureate degree. The student will receive one diploma with both majors listed on it. The two majors may be in the same or different Colleges within the University. The following requirements must be met:

1. The student must receive approval of the dean(s) of the college(s);
2. All University and college(s) requirements must be satisfied;
3. All required courses in each major must be completed; and satisfy whatever conditions are set by the department(s) in which the majors are offered.

Two Degrees

A candidate for a second baccalaureate degree must have completed all the essential work of the second curriculum not covered in the first. In all such cases the total semester hours required must be at least 30 semester hours additional to the greater number required for either degree. A student is required to obtain a letter from the department head of the second degree plan program stating the courses required for the second degree. The student will pay two diploma fees and receive two diplomas.

Graduation with Honors

Categories for honors shall be designated as follows:

1. **Summa Cum Laude:** A student may be graduated "Summa Cum Laude" with a grade point ratio of 3.900 or above.
2. **Magna Cum Laude:** A student may be graduated "Magna Cum Laude" with a grade point ratio of 3.700 through 3.899.
3. **Cum Laude:** A student may be graduate "Cum Laude" with a grade point ratio of 3.500 through 3.699.

To be eligible for graduation with honors, a student seeking a baccalaureate degree must enroll in and complete a minimum of 75 semester hours preceding graduation at this institution. Course credit received by examination is not included in this total. The grade point ratio of all college hours attempted, excluding transfer hours, must equal that required at Texas A&M University for the appropriate category of honors.

FINANCIAL INFORMATION

Expenses

The expenses for a regular session of nine months will vary with the individual concerned and with the course of study pursued. In the case of new students, the total cost should range between \$6,100 and \$7,600. In general these amounts include three types of expenditures: fees payable to the TAMUG Fiscal Office, textbooks and supplies, and incidental expenses which are estimated in the range of \$600 to \$1,500, depending on the individual concerned. Non-resident students, other than those pursuing a license-option curriculum, should increase these estimated expenses by \$3,210 per term (15 credit hrs.) to cover non-resident tuition fees.

Incoming students from out of town or out of state may wish to open a local bank account with a cashier's check or traveler's check instead of a personal check. The local banks have a policy that a personal check must clear before a check can be written on the new account. This process may take a week to two weeks before a check may be written. The campus will accept out-of-town and out-of-state checks for payment of fees and bookstore purchases.

Fees

The fees set out herein for 1996-97 are approximations and are subject to change because of economic conditions, legislative requirements, or actions of the Texas A&M University System Board of Regents.

The fees listed below are for all Texas resident students except those in license-option curricula. The fees are based on a student registered for 15 credit hours during the fall and spring semesters and six credit hours during a term of the summer session.

	Fall Semester	Spring Semester	Summer Session* (5 weeks)
Tuition** (see explanation of fees)	\$480.00	\$480.00	\$160.00
Student Services	109.92	109.92	350.00
Room (Double)	890.00	890.00	313.93
7-Day Board Plan***	936.36	936.36	627.85
Room Deposit	250.00		
Identification Card	5.00	5.00	3.00
Computer Use Fee	90.00	90.00	36.00
General Property Deposit	10.00		
General Use Fee	330.00	330.00	132.00
Group Hospital Fee	25.00	25.00	12.50
Library Use Fee	45.00	45.00	18.00
Student Center Complex Fee	12.50	12.50	6.25
Total	\$3,183.78	\$2,923.78	\$1,118.64
	out of state +3210	+3210	+1070
	6393.78	6,133.78	2,188.64

*The fees for one summer session should be doubled if you enroll for both sessions for the same number of credit hours.

**Non Resident students who are not enrolled in a license option will pay \$3,690 tuition for 15 credit hours.

***Includes state and city tax of 8.25% for board only.

For license-option curriculum (based on 15 hours during the regular school year or four hours for summer cruise):

	Fall Semester	Spring Semester	Summer Cruise
Tuition	\$600.00	\$600.00	\$160.00
Student Services	109.92	109.92	36.64
Room (Double)	890.00	890.00	700.00
7-Day Board Plan	936.36	936.36	627.85
Room Deposit	250.00		
General Property Deposit	10.00		
Identification Card	5.00	5.00	3.00
Computer Use Fee	90.00	90.00	
Cruise Fee			575.00
General Use Fee	150.00	150.00	40.00
Group Hospital Fee	25.00	25.00	25.00
Library Use Fee	45.00	45.00	*12.00
Student Center Complex Fee	12.50	12.50	6.25
Total	\$3,123.78	\$2,863.78	\$2,185.74

*Includes state and city tax of 8.25% for board only.

Payments

Payments to the Fiscal Office may be in the form of cash, cashier's check, personal check, or money order payable to Texas A&M University at Galveston. All checks and money orders are accepted subject to final payment.

Drop/Add Refunds

A student may drop courses during the first five class days of a fall or spring semester and during the first three class days of a summer term or a 10-week summer semester. A student may add courses during the first seven class days of a fall or spring semester and during the first four class days of a summer term or a 10-week summer semester. Full refunds or supplemental billings will be made for courses dropped or added during these times. Notices of amounts owed will be mailed to the student's local address. Drop refunds will be processed after the 12th class day of a fall or spring semester and the fourth class day of a summer term or a 10-week summer semester. (Note: Except those refunds associated with receipt of financial aid which is contingent upon the number of semester

in state \$24.4K
out of state \$50.1K

credit hours taken during a semester. These refunds will be issued shortly after these times.)

Withdrawal from the University

Once a fee payment has been accepted by the University, a student is considered officially enrolled. Stopping payment on a check for fees or allowing the check to be returned unpaid by the bank for any reason does not constitute official withdrawal. Students wishing to withdraw should contact the Admissions and Records Office. Failure to follow procedures for withdrawing from the University may result in financial penalties and difficulty with future enrollment in the University.

Explanation of Fees

Tuition

Texas resident students pay thirty-two dollars (\$32) per semester credit hour, but the total of such charges shall not be less than one hundred-twenty dollars (\$120) per semester or sixty dollars (\$60) per summer term.

Non-resident and international students pay two hundred forty-six dollars (\$246) per semester credit hour.

Students enrolled in license-option curricula, whether resident or non-resident, pay forty dollars (\$40) per semester credit hour, but the total of such charges shall not be less than one hundred fifty dollars (\$150) per semester or the summer cruise.

Students who are dismissed or withdraw from a license-option curriculum after the semester begins will have fees adjusted to the appropriate resident or non-resident rate retroactive to the beginning of the semester.

License-option students who enroll in summer shoreside classes will pay resident or non-resident fees as appropriate. License-option students who are granted a leave of absence for the summer and who enroll in the onshore summer program at the Mitchell Campus instead of the summer training cruise will pay 10 fees as appropriate for that period. License-option students must complete all three cruises within four summers.

Under special circumstances, non-license option students may be granted permission to participate in the Corps of Cadets. Non-license option students in the Corps of Cadets are not eligible for the special license-option tuition and will pay normal resident or non-resident fees as applicable.

Students who in any semester register (including payment of fees) on or after the first class day pay an additional ten dollar (\$10) fee.

Application Fee

Students who make new application to the University pay a \$35 fee.

Campus Housing & Board Plans

All undergraduate students enrolled in more than nine credit hours are required to reside in campus housing if available and purchase the five- or seven- day board plan. The

limited exceptions to this requirement are detailed in the Housing section of this catalog. Any student living off campus at the beginning of the semester who adds enough hours to require living on campus must pay for room and board for the entire semester. Two meal plans are offered through the board plan.

Fall and Spring

5-Day Plan 3 meals each day, Monday-Friday, \$805 + \$66.44 tax = \$871.41
7-Day Plan 3 meals each day, \$865 + 71.36 tax = \$936.36

Summer

5-Day Plan 3 meals each day, Monday-Friday, \$265 + \$21.86 tax = \$286.86
7-Day Plan 3 meals each day, \$290 + 23.93 tax = \$313.93

Two optional meal plans are available for off-campus students.

Fall and Spring

Any 5 meals \$265.20 + \$21.86 tax = \$286.86
Any 10 meals \$500 + \$41.25 tax = \$541.25

Summer

Any 5 meals \$80.00 + \$6.60 tax = \$86.60
Any 10 meals \$180.00 + \$14.85 tax = \$194.85

A deposit of \$250 is required to apply for a room in a residence hall. This fee will be retained as a deposit against damage or late cancellation, or to keep the application on active file. Upon withdrawal from TAMUG, any debts owed the University by the student may be withheld from the housing deposit. A reservation may be canceled and the deposit refunded upon written request prior to July 1 for the fall semester, December 15 for the spring semester, May 10 for the first summer session and June 20 for the second summer session. Any cancellation after the above dates will result in forfeiture of the deposit. A refund may be made in accordance with the TAMUG policy for a student graduating or withdrawing from school, upon request, after clearance by the Residential Services and the Student Affairs Offices. The balance of the refund due will be issued through the Fiscal Office after deducting all debts owed by the student to the University. Seniority in campus housing and on the residence hall waiting list will be based upon the date of receipt of the room deposit; however, the deposit does not guarantee assignment to on-campus housing.

Residence Hall Room Fees

Housing Fall/Spring Double = \$890 Housing Fall/Spring Single = \$1,025
Each 5-week Summer Term = \$350 Summer Cruise = \$700

Computer Use Fee

The computer use fee is charged at the rate of \$6 per semester credit hour. This fee will be used to compensate for services provided by various microcomputer facilities on campus.

Engineering Equipment Access Fee

A student registering in certain engineering courses may be required to pay a \$70 Engineering Equipment Access Fee. The fee will not exceed \$70 per course or \$210 per semester.

General Use Fee

This fee of \$22 per semester credit hour is assessed to compensate for occupancy, services, use and/or availability of all or any of the property, buildings, structures, activities, operations and other facilities of the campus.

Health Center Fee

This fee is required of students enrolled for six semester credit hours or more at the rate of \$25 for each regular semester, \$25 for the summer training cruise if enrolled in four credit hours or more, and \$12.50 per five-week summer term if enrolled in three credit hours or more. This fee will finance health services provided by a local clinic and a physician and two medical assistants on the summer training cruise.

Identification Card

All students must have an identification card. This card is used in registration procedures, collection of fees, cashing of checks, for dining hall privileges, etc. During the fall and spring semesters, the identification card fee will be \$5. Replacement cards will be issued upon payment of an \$8 fee.

Installment Plan

Certain students have the option of paying tuition and required fees in three installments for a fee of \$15. Eligibility requirements can be obtained through the Fiscal Office. The installment plan is not available for the summer semesters.

Laboratory Fees

A laboratory fee ranging from \$8 to \$30 is charged for each laboratory course each semester.

Library Use Access Fee

The Library is assessed at the rate of \$3 per semester credit hour. Funds collected for this fee are devoted to enhancement of library holdings and services.

New Student Orientation Conference Fee

The orientation conference fee is required of all new freshmen and transfer students enrolling in fall or spring semesters and selected summer terms at the rate of \$25 per

student. This fee supports the provision of advanced materials to accepted students, the conduct of professional orientations, and state-mandated diagnostic testing.

Parking Permit

All students parking an automobile or motorcycle on the campus pay a fee of \$40 for the academic year. A \$20 summer parking fee, independent of the academic year fee, is assessed for the entire summer term. Boat permits will be issued for a fee of \$30 per regular semester and \$15 per 10-week summer term. Bicycle owners must pay a registration fee of \$10 per semester (\$30 maximum per year).

Residence Hall Room Key Replacement Charge

Students who must replace their residence hall room key, will be charged a \$10 fee.

Student Services Fee

The student service fee is required of all students at the rate of \$9.16 per semester credit hour not to exceed \$109.92 per semester or \$54.96 per five week summer term. Student services fees finance recreational activities, student government, student publications, student organizations, campus movies, intramural athletic programs, and social activities. The fee also provides counseling, graduate placement, financial aid, and multicultural services.

Student Center Complex Fee

The student center complex fee is required for all students at the rate of \$12.50 per semester (\$6.25 per five-week summer term or cruise). This fee will be used for the operation, maintenance, programming improvement, and purchase of equipment for the student center complex and for the acquisition or construction of additions to the complex.

10-Week Summer Semester

Students may register for 10-week summer semester courses during the first summer term registration. They will be charged the minimum tuition of \$120. All other mandatory and/or optional fees will be based on the number of hours taken.

Other Expenses

Textbooks and Supplies: The cost of textbooks and supplies will vary with the quality of items purchased and with the course of study pursued. Students can expect to pay an amount ranging from \$350 to \$400. These amounts are estimates for the combined fall and spring semesters. Expenses for the summer term should amount to approximately one-half of the above estimates.

Uniforms: License-option students must purchase uniforms with initial outfitting estimated at \$850.

Mail Service Fee: The university operates a mail service for students wishing to receive mail on campus. The fee is \$13 per semester for each student and \$13 per 10-week summer term.

Graduation Fee: There is a \$20 fee for graduation. This should be paid within the first two weeks of the student's final semester.

International Student Service Fee: International students who not sponsored are assessed a \$20 fee each semester to defray administrative support costs.

Field Trip Fees: A field trip fee ranging from \$15 to \$2,000 may be charged for courses that include field trips.

Other Items: Students may wish to purchase the *Voyager*, the campus annual. Tickets to Texas A&M University home games may also be purchased at registration. The University operates a store for the purpose of supplying necessary articles to students. The store carries textbooks, stationary, drawing instruments, toilet articles and other supplies. All merchandise is sold at the usual retail prices prevailing in the area. Major credit cards are accepted in the bookstore.

Exemptions

Certain students in the following classifications are exempt from paying tuition and some of the required fees by action of the State of Texas and the Texas A&M University System Board of Regents. Specific eligibility requirements under these provisions can be obtained from the Fiscal Office.

Dependent children of disabled or killed-on-duty firemen are exempt from paying tuition and laboratory fees.

Blind and deaf students who are eligible for the rehabilitation services of the State Commission for the Blind and/or Division of Vocational Rehabilitation of the Texas Education Agency are exempt from tuition and laboratory fees.

Certain veterans (and dependents of veterans who died in active service), who are not eligible for federal educational benefits, who are Texas citizens and who were honorably discharged, may be exempt from paying tuition and laboratory fees. Orphans of members of the Texas National Guard and Texas Air National Guard killed since January 1, 1946, while on active duty either in the service of their State or the United States may also be eligible under this provision.

Officers, enlisted persons, selectees, or draftees of the Army, Army Reserve, Army National Guard, Air National Guard, Air Force, Air Force Reserve, Marine Corps, Marine Corps Reserve, Coast Guard, or Coast Guard Reserve of the United States, who are assigned to duty in Texas and their spouses and children, are entitled to pay the tuition fee required of Texas residents.

Teachers or professors employed at least one-half time on a regular monthly salary basis by institutions of higher education in Texas, and their spouses and children, are entitled to pay the tuition fee required of Texas residents.

Non-resident students who are awarded competitive academic scholarships of at least \$1,000 by the TAMUG Scholarship and Awards Committee for the academic year are entitled to pay Texas resident tuition for the academic year that the scholarship covers. The non-resident status is unchanged.

The State Board of Education will certify 235 students from other nations in the American Hemisphere to be exempt from paying tuition at institutions of higher learning in the State of Texas.

Full-time employees of the Texas A&M University System are exempt from paying all fees except tuition, laboratory fees and I.D. card.

Students registered only in courses which have been designated as "off campus" are exempt from paying all fees except tuition, a building use fee of \$22 per semester credit hour, laboratory fees and I.D. card.

Students registering concurrently at two Texas public institutions of higher education are subject to the following tuition procedure:

1. A student must register at the institution with the lower minimum tuition and pay the full tuition charge.
2. Generally, only the hourly rate is paid at the second institution. However, if the minimum amount is less at the first institution, then the student must pay the difference in the two minimums to the second institution, but not less than the hourly rate.

Refunds

Refunds of fees shall be made to students officially withdrawing according to the following withdrawal schedule:

Tuition, Student Services Fee, Laboratory Fee and Residence Hall Fees:

Fall or Spring Semester

Prior to the first class day	100 percent
During the first five class days	80 percent
During the second five class days	70 percent
During the third five class days	50 percent
During the fourth five class days	25 percent
After the fourth five class days	None

Five-week Summer Term

Prior to the first class day	100 percent
During the first, second, or third class day	80 percent
During the fourth, fifth, or sixth class day	50 percent
Seventh day of class and thereafter	None

Refunds on residence hall rent will not be made unless the room vacated is rented within 10 days to a student residing in other than University-owned property. If the room is rented within this 10-day period to a student not residing in University-owned property, refunds will be made in accordance with the above schedule.

Board Fee Refunds: Board fees are refundable in full prior to the first day of classes. Refunds will be made only in case of official withdrawal at which time a pro-rata

refund will be made, computed on a daily basis, less a withdrawal fee equaling 10 percent of the semester rate.

In case of a consecutive absence of 10 or more days due to illness of the student or member of his or her family or for some other unavoidable cause, a pro-rata refund will be made, computed on a daily basis.

Drop/Add Refunds: Full refunds or supplemental billings will be made after the 12th class day for courses dropped or added during the first 12 class days of a fall or spring semester and during the first four class days of a summer term or a 10-week summer semester. (Exception: Refunds resulting from receipt of financial aid cannot be made until after 12th class day or fourth class day reports are available.) Notice of refunds due or amounts owed will be mailed to the student's local address. Consequently, students are obliged to ensure that their correct local address and telephone number are on file in the Office of Admissions and Records.

Financial Aid Recipients: Students receiving financial aid may owe some portion of any refund back to the appropriate federal or state programs. Financial aid refunds are determined prior to the release of any funds to the student who has withdrawn.

Reductions

No reduction will be made in the charge of room rent and board in case of enrollment within 10 days after the opening of a semester or summer term. Nor will a refund be made in case of withdrawal during the last 10 days of a semester, or summer term, or the last days for which payment is made.

Unpaid Check

If a check accepted by the Fiscal Office is returned unpaid by the bank on which it is drawn, the person presenting it will be required to pay a penalty of \$20 in the form of cash or money order and, if not redeemed, the student may be dropped from the rolls of the University. In addition, the check may be turned over to the District Attorney for prosecution. A student dropped from the rolls of the University for failure to redeem an unpaid check within the grace period is eligible for reinstatement after payment of penalties, a \$50 reinstatement fee and redemption of the check.

Student Financial Responsibility

Students are responsible for the balance in their accounts. Any delinquent balances (tuition and fees, installments, student loans, returned checks) remaining at the end of the semester may be referred to a collection agency/credit bureau. Any collection charges are the responsibility of and payable by the student.

STUDENT SERVICES

The Office of Student Affairs coordinates the student life programs and activities of TAMUG. Information is available from this office concerning new student orientation, advanced placement testing, international students, counseling services, housing, financial aid, health services, student activities, graduate placement, and handicapped and multicultural services.

Student Financial Assistance

The purpose of student financial aid at TAMUG is to assist students in meeting the reasonable costs of their education. Financial aid is available to eligible U.S. citizens and non-resident aliens who are enrolled in degree granting programs making satisfactory academic progress toward a baccalaureate degree.

Financial aid may include federal and state grants, scholarships, work opportunities, and student loans. Students submitting a complete application will be considered for all types of need-based assistance.

To apply for financial aid please submit the following items:

- Free Application for Federal Student Aid (FAFSA). On question 92 list Texas A&M University at Galveston, P.O. Box 1675, Galveston, Texas 77553.
- Title IV Code 010298.
- Federal Student Aid Report (SAR).
- Transfer students must submit a Financial Aid Transcript from every school previously attended even if you did not receive financial aid.
- If your application is selected for Verification, you will be asked to substantiate the information you reported on the FAFSA.

Costs of Attendance: TAMUG uses average costs of attendance in determining financial need. These costs include tuition and fees (30 hours per year FTE), room and board, books and supplies, personal expenses, and transportation. Additional costs may be added for child care or disability-related expenses. There are three major categories of student budgets: Texas resident \$8,620 (9 mo.), non-Texas resident \$15,040 (9 mo.), and cadet \$11,630 (12 mo.).

General Priority:

Priority Deadlines: The Federal Supplemental Educational Opportunity Grant (FSEOG) program requires financial aid applicants to be prioritized by Pell Grant eligibility and Expected Family Contribution (EFC) and awarded based, generally, on Pell eligibility and the lowest EFC. In order to fulfill this requirement, Texas A&M University at Galveston has the following FSEOG priority deadlines for the 1996-1997 academic year:

April 1, 1996	Fall 1996
October 1, 1996	Spring 1997
March 1, 1997	Summer 1997

If FSEOG funds remain after the initial awards are made, an additional deadline will be made to award the remaining funds. This deadline applies only to the FSEOG program. Students who do not meet the deadline are still eligible for other financial aid.

General Guidelines: The Financial Aid Office adheres to the following guidelines when awarding financial aid to students who complete their files after the beginning of a semester:

Students completing their 1996-1997 financial aid letter **after:**

- November 1, 1996 will only be packaged for spring 1997
(cadets going on cruise will also be packaged for the summer 1997).
- April 1, 1997 will be packaged for the summer 1997.

These guidelines were developed so that the Financial Aid Office can establish fund balances in the aid programs for the following semester. All students should strive to complete their files before these dates.

Satisfactory Academic Progress Policy: The purpose of the TAMUG Satisfactory Academic Progress Policy for financial aid is to ensure that students benefiting from financial assistance make reasonable and consistent progress toward a baccalaureate degree. TAMUG's policy is consistent with U.S. Department of Education and Texas Higher Education Coordinating Board guidelines. The policy measures both qualitative and quantitative progress and is the applicable minimum standard for all types of financial assistance awarded by TAMUG.

Satisfactory academic progress for financial aid is deemed as: the maintenance of a cumulative GPR of 2.0 or greater and the successful completion of at least 24 credit hours per academic year.

Students who do not meet the standard will be placed on financial aid probation for the next semester enrolled; they may receive financial assistance in the probationary semester. If in the probationary semester the student achieves a 2.5 GPR and completes every class attempted, then probation may be continued on a semester-by-semester basis until the student's cumulative GPR is greater than 2.0. If the student does not achieve a 2.5 semester GPR and the cumulative GPR is still below 2.0, then financial aid eligibility is terminated.

Financial aid termination may be appealed in writing to the Campus Director of Financial Aid. Appeals are considered on a case-by-case basis due to extenuating circumstances. Appropriate documentation will be required to substantiate the appeal.

Freshmen, matriculating as full-time students, shall have six years of aid eligibility in which to complete a degree. Transfer student eligibility will be prorated accordingly.

Financial Aid Available:

Grant Programs: Grants are awarded based on financial need. Grants do not have to be repaid. TAMUG participates in these programs: Federal Pell Grant, Federal Supplemental Educational Opportunity Grant, State Student Incentive Grant, State Scholarship for Ethnic Recruitment, Texas Tuition Scholarship, and Texas Public Education Grant.

Scholarships: Scholarships are generally based on academic achievement and leadership. The TAMUG Scholarship and Awards Committee evaluates applicants and makes awards in the spring for the following academic year. The committee uses the admission

application for freshman awards. There is not a separate freshman scholarship application for TAMUG-awarded scholarships.

A limited number of non-resident students awarded a competitive TAMUG scholarship valued at \$1,000 or more are eligible to pay resident tuition.

All students are encouraged to apply for scholarships offered in their hometowns or from national sources. Information regarding such sources is available from high school counselors and reference materials in public libraries.

Opportunity Award Scholarships are made to freshmen who have not previously attended college. To apply, a student must be regularly admitted to the University and be a U.S. citizen or permanent resident. You must complete a scholarship application available from the Financial Aid Office prior to January 15, send SAT or ACT scores to the Admissions Office prior to February 1, and submit a high school transcript reflecting all grades through the end of the fall semester of the senior year. These should be returned to the Financial Aid Office at Texas A&M University at College Station.

Academic Excellence Awards are made to continuing sophomores, juniors, and seniors who have established an academic record with TAMUG. Full-time students who have achieved a GPR of 2.5 or higher are eligible to apply. Applications are available in the Financial Aid Office and are due by March 1 for consideration for the following academic year. These should be returned to the Financial Aid Office at Texas A&M University at College Station.

Part-Time Student Employment: All students who are making satisfactory academic progress are eligible to work on campus without regard to financial need. The Human Resources Office coordinates both on- and off-campus employment.

Interested students may seek positions through the job listings posted with the Human Resources Office. Student employment is limited to 20 hours per week, there are no fringe benefits, and students must maintain a 2.0 GPR.

A limited number of Federal and Texas Work-Study awards are made each year through the Financial Aid Office. Students awarded from either source still must seek their positions through the regular student employment process.

Student Loan Programs: TAMUG participates in these loan programs: Federal Perkins, Federal Stafford Student Loan, Federal Unsubsidized Stafford Student Loan, Federal Parent Loan for Undergraduate Students, and College Access Loans. All loans require an application and a promissory note. Credit reviews may be performed on Federal PLUS and Texas CAL loans. New borrowers are required to attend entrance loan counseling before receiving the first disbursement of any loan.

Students who have borrowed money through federal or state student loan programs are required to receive exit loan counseling when they graduate, withdraw, or drop below 1/2 time enrollment.

Disposition of Student Aid Funds: Students awarded grants or TAMUG scholarships will have funds credited to their accounts by the first day of class in the Fiscal Office. Scholarship awards must be sent to the Financial Aid Office indicating the recipient and made payable to TAMUG. These will be credited to the student's account. Student employees are paid biweekly.

Beginning fall 1996, student loan proceeds are available for EFT. EFT is a system of electronic fund transfer which credits the loan funds to the student's account. This eliminates standing in line for loan checks. Or, student loan checks are made payable to the

student and are available in the Fiscal Office. Veterans Benefits are paid directly to the student.

Enrollment is verified prior to the release of any financial aid. Fiscal refunds due to financial aid credits are made after the 12th class day. Freshmen, enrolled in their first semester of study will have the proceeds of their first loan disbursement held for 30 days in accordance with federal law.

Students must come to campus prepared to pay for deposits, books, supplies, sundries, and for Cadet uniforms.

Emergency Tuition and Fee Loans are available through the Student Financial Aid Office for students needing assistance with fee payments. The following is an excerpt from the Emergency Tuition Loan Application which is available from the Financial Aid Office:

The enabling provision of House Bill 1147; 69th legislature, 1985, requires that you show evidence of being financially unable to pay tuition and required fees in order to be considered for this emergency loan. My signature below indicates that I understand that the evidence required is the Student Aid Report (SAR) from the Free Application for Federal Student Aid. Also, this loan can only be approved for the difference between the amount of my first installment and one half (1/2) of the printed Expected Family Contribution (EFC) on my Student Aid Report (SAR). I further understand that if the loan is granted that I will repay the loan before the second installment due date and that the loan will bear interest at a rate of 5% per annum beginning the day the loan is credited.

Refund and Repayment Policy: Students who receive financial aid and withdraw, or are expelled from TAMUG, may owe a portion of any refund back to one or more financial aid programs. In accordance with federal law, refunds are made to financial aid programs first, then to students.

The term "refund" refers to a return of school charges (generally tuition, fees, room and board) made to a student due to their withdrawal. The Fiscal Office is responsible for calculating the gross amount of a refund using the policy published in the catalog. The Financial Aid Office reviews refunds to determine if, and in what amounts, funds should be returned to federal or state financial aid programs in accordance with applicable federal and state regulations.

Funds returned to financial aid programs will be credited based on the prioritized list below:

- FFEL Loans (Stafford, SLS, PLUS)
- Federal Perkins Loan
- Federal Pell Grant
- Federal SEOG
- Other Title IV aid programs
- State aid programs
- Private scholarships
- The student

A student may also owe a repayment to a financial aid program due to withdrawal from TAMUG. Repayments result from cash disbursement of financial aid that the student is not entitled to if they withdraw.

Veterans Benefits: The Admissions & Records Office files claims for Veterans Benefits verifying a veteran's enrollment at TAMUG. Students are asked to submit the following documents to substantiate their claim: certified copy of their DD-214 showing an honorable discharge from service, a signed degree plan for your major indicating all of the courses necessary to receive that degree, VA form 22-1990 to establish eligibility or VA form 22-1995 to transfer their eligibility. Other documentation may be required. Enrollment is certified and claims are forwarded to the appropriate VA regional office. Adjudication may take four to six weeks; therefore, VA students should come to TAMUG ready to pay the initial costs of enrollment. Veterans are required to maintain a cumulative GPR of 2.0 or greater and successfully complete 24 credit hours per year to maintain eligibility. Students failing to meet the standard are placed on probation for one semester. Students who achieve a 2.5 GPR in the probationary semester and complete every class they start are eligible for a second probationary semester. A student who fails to meet the terms of their VA probation, or have not achieved a cumulative GPR of 2.0 after their second probationary semester, will be reported to the VA as making unsatisfactory progress.

Hazlewood Tuition Exemption: Texas residents who have fully exhausted all potential Veterans Benefits and are not eligible for any other federal or student grant benefits (including Pell, SEOG, and SSIG) should contact the Financial Aid Office to determine if they are eligible for a Hazlewood tuition exemption.

Inquiries regarding financial aid or veterans benefits may be addressed to the Financial Aid Office, Texas A&M University at Galveston, P.O. Box 1675, Galveston, TX 77553-1675. (409) 740-4500.

Career Planning and Placement

The Office of Career Planning and Placement provides a wide variety of assistance to graduating students seeking professional employment. Its services include job search information, career planning, and corporate recruiting.

The Office of Career Planning and Placement hosts recruiters from different employing organizations. It also provides individual and group career counseling services to insure that Texas A&M University at Galveston graduates are well informed, prepared for the job search, and availed of every opportunity to choose from professional alternatives. There is also a career resource room which contains a variety of information on careers and job search techniques. Each fall the office hosts a Career Exploration Day, targeted to the freshmen, sophomore, and junior level students. This day is an opportunity for students to explore future career options.

The use of the services provided by the Career Planning Office at Galveston are limited to students and former students of Texas A&M University. Students who wish to use these services should register with the office as early as their sophomore year and avail themselves of the available resources. Before participating in on-campus job interviews, students are required to complete a credentials file. Appointments are necessary for individual counseling. All other services are available during regular office hours.

Counseling

Students who need counseling concerning non-academic problems or vocational choices should seek assistance from the Campus Director of Counseling in the Office of Student Services.

Educational, career, and personal counseling are provided for all students. Aptitude and achievement testing, as well as interest and personality inventories are available along with professional interpretation. In addition, referral for the use of specialized community resources will be coordinated upon the student's request.

Health Services

Medical Clinic: Texas A&M University at Galveston contracts with local community clinics for health services for enrolled students. Terms of the contract may vary from year to year, but generally office visits to the doctor are free of charge. Medications, inoculations, x-rays, physicals, and other services provided at the clinic are generally available at a reduced cost. Hospitalization and emergency room visits are full-charge at the student's expense. Educational pamphlets concerning HIV/AIDS are available to students from the Counseling Office.

Group Insurance: Since there are numerous health needs and costs which are not provided or paid for by the Campus Health Service, students are encouraged to purchase medical insurance. A group plan is available to all students in The Texas A&M University System. Applications for this program will be distributed during new student orientation and are available from the Office of Student Affairs. Students and parents should give careful consideration prior to dropping any current health insurance.

Summer Cruises: When the T/S TEXAS CLIPPER II departs each year for the annual summer training cruise, a physician and two medical assistants operate an on-board dispensary. All services provided on board are free of charge. Should a student require hospitalization ashore or evacuation, the student will be responsible for all costs incurred because of such hospitalization or evacuation.

Housing

Texas A&M University at Galveston has on-campus housing in modern student residence halls. Rooms are double occupancy and furnished with beds, desks, chairs, wardrobes or closets, and dressers. Students are expected to furnish pillows, blankets, shower curtains, linens, and cleaning supplies. With limited exceptions, all Texas A&M University at Galveston students are required to live in campus housing and participate in the board plan if campus housing is available. Approximately 50 percent of the undergraduate students are housed on campus, and returning students are given priority in granting permission to live off campus. Campus residents accepting housing in the fall semester are required to sign a nine-month contract and are not permitted to move off campus for the spring semester.

An application for campus housing, which is separate from the application for admission to the University, is available from the Office of Student Affairs. This application, along with the \$250 required housing deposit, should be returned to the Texas A&M University at Galveston Fiscal Office. Rooms are assigned in accordance with the date on

which the housing application and room deposit are received in the Fiscal Office.

Housing applications may be forwarded prior to acceptance to the University but housing assignments will be contingent upon admission to the University. It is recommended that housing applications be submitted early. In the event that on-campus housing is not available, information concerning off-campus housing will be provided upon request.

Since license-option students are required to live on campus, students will be able to pursue a license option only if campus housing is available for them. A failure to receive campus housing does not preclude students from enrolling in the degree program of their choice but simply restricts participation in license-option programs until campus housing is available. LO students are housed separately from non-LO students. Questions concerning LO housing should be directed to the Housing Office.

Student Activities

A wide variety of student activities is coordinated through the Office of Student Affairs in the Northern Student Center. The Northern Student Center contains dining facilities, a book store, a game room, financial aid, counseling, student activities, and graduate placement offices and other facilities. Adjacent to the Northern Student Center are the gymnasium, swimming pool, tennis courts, and other outdoor recreational facilities.

Clubs: Clubs on campus include the American Society of Mechanical Engineers, Sail Club, Caving Club, Dive Club, Propeller Club, Student Life Organization, Student Association of Maritime Administrators, Society of Naval Architects and Mechanical Engineers, the Drama Club, an environmental group, and others.

Student Government: The student government of Texas A&M University at Galveston is the Student Senate. This Senate serves as a direct link to the administration regarding student life. Members are elected each year.

Student Publications: Students publish a newspaper, *The Nautilus*; a literary publication, *Seaspray*; and a yearbook, *Voyager*.

Athletics: The Recreational Sports Program provides each student with the opportunity to participate in regularly organized activities. Co-rec teams are organized in flag football, basketball, softball, and volleyball. Texas A&M University at Galveston also has softball, volleyball, soccer, and rugby teams which compete in local leagues. The Campus Sail Team and Rowing Club compete in intercollegiate competition.

Multicultural Services

The Department of Multicultural Services works with other programs on campus to support the cultural, educational, social, and personal development of ethnic minority students. The purpose is to coordinate and disseminate information about services available to ethnic minorities. The primary mission is to facilitate full participation of African American, Hispanic, Asian American, and Native American students in the mainstream of university life. For information, please call (409) 740-4427.

Hazing

Anyone who participates in hazing is in violation of University rules as well as state law. Violators may be subject to University disciplinary action in addition to state criminal penalties. Hazing means any intentional, knowing, or reckless act occurring on or off the campus by one person, alone or acting with others, directed against a student that endangers the mental or physical health or safety of a student for the purpose of pledging, being initiated into, affiliating with, holding office in, or maintaining membership in any organization whose members are (or include) students at the University. A complete definition of hazing is available in the Student Services Office.

C O R P S O F C A D E T S

Students pursuing a University degree program leading to a United States Coast Guard License as a merchant marine officer are required to join the TAMUG Corps of Cadets. The Corps of Cadets program provides a learning laboratory for the development of leadership and management skills and the self-discipline demanded of merchant marine officers. Cadet Corps policies provide for the organization of the cadets into a military unit, with muster, watch standing and shoreside training requirements, room and ship maintenance responsibilities, and special cadet discipline procedures. Cadets must also complete training in firefighting, first aid, and cardiopulmonary resuscitation techniques. Cadets are encouraged to apply for midshipman status in the U.S. Naval Reserve. Cadets wear prescribed uniforms during regular school semesters and during required summer training cruises. Questions concerning Corps life should be addressed to the Commandant's Office. With special permission, it is possible for students who are foreign nationals to participate in the Corps of Cadets. However, due to federal regulations, such students are not eligible to be examined for a license as an officer in the U.S. Merchant Marine and are thus not eligible for special license-option tuition fees.

Admission to a License-Option Curriculum

Students who meet the admission criteria established by the United States Maritime Administration and the University may participate in the Corps of Cadets and a license-option curriculum. Such participation is a privilege and not a right. Serious or excessive violation of Corps rules and regulations may be considered as evidence of inaptitude for the demanding career of a merchant marine officer and warrant dismissal from the Corps and the license-option curriculum. Notification of acceptance to the University is not final approval for appointment to a license-option program or acceptance into the Corps of Cadets. The application form for acceptance into the Corps of Cadets is available from the Commandant's Office. Final review of a student's credentials cannot be completed until after enrollment and prospective cadets will not be sworn into the program until this review is completed. The initial enrollment of students in a license-option curriculum must be at the beginning of a fall or spring semester. Students may not enter the program after the 12th class day of the semester.

License-option students are subject to alcohol and drug screening for admission to and participation in the program.

Among the criteria evaluated are:

1. **Age.** The U.S. Maritime Administration restricts student incentive payments to USMS cadets who are at least 17 but who have not passed their 25th birthday on the first day of enrollment in a license-option curriculum. Special admission may be granted to students older than 25. Cadets selected for special admissions are not eligible for any of the student incentive payments offered. These cadets, however, will participate fully in every other aspect of the license-option program. They will be subject to the same requirements, privileges, considerations, and obligations as cadets meeting the federal age requirements.

2. **Physical requirements.** Strict physical requirements are specified for licensing as a merchant marine officer. Prior to entering a license program, prior to certification for licensing, and at any other time deemed appropriate by the University, students are required to furnish verification from a physician that they meet the specified physical requirements. These are summarized as follows:

Deck Cadet—Minimum vision 20/200 in each eye correctable to 20/40 in each eye. Vision beyond these parameters requires a waiver. Pass a Coast Guard approved color vision test.

Engineer Cadet—Minimum vision of 20/200 in each eye correctable to 20/50 in each eye. Vision beyond these parameters requires a waiver. Distinguish between red, blue, green, and yellow.

All Cadets—Epilepsy, insanity, badly impaired hearing, and mind-altering drugs use are disqualifying conditions.

Specific details of the required physical examinations are contained in the Title 46 U.S. Code of Federal Regulations part 10. Waivers cannot be granted by the University.

3. **Background Investigation.** All applicants for admission to license-option curricula and enrollment in the Corps of Cadets are subject to a federal background investigation. Adverse information revealed by the investigation may result in denial of license by the U.S. Coast Guard. The University will not accept a candidate into a license-option curriculum nor allow continued participation in the program when conduct infractions preclude license qualification.
4. **Citizenship.** Only United States citizens are eligible for officers' licenses in the U.S. Merchant Marine.
5. **Drug Screening.** All license-option cadets must participate in a drug testing program. All entering cadets will be required to pay for and take a drug screen test prior to entering the Corps. Periodic random tests are required and any serious marine incident will require drug testing. These tests/screenings will be performed at an Approved DHHS Laboratory, in accordance with CFR 46.16.340. A positive test during initial screening may result in the student not being accepted into the LO program. A positive test during a periodic or other screening may result in dismissal from the Corps of Cadets and LO programs.

Note: The U.S. Coast Guard presently requires payment for all documents and tests that are required for license and graduation.

Firefighting School must be completed prior to the cadet's first cruise and its costs are the cadet's responsibility.

Cadets are required to have or have ordered, at their cost, all required Corps uniforms during orientation.

Examination Requirement as a Condition for Graduation

While not a University academic requirement, in accordance with federal regulations and the University's participation agreement with the U.S. Maritime Administra-

tion, students who enter the U.S. Merchant Marine Licensing program in the fall of 1991 and after, with the expected graduation date of spring/summer 1995, will be required to pass the examination administered by the Coast Guard for the issuance of a license as a condition of graduation from Texas A&M University. Any student who graduates in 1995 or in subsequent years, but who entered the maritime program before the fall of 1991, will not be affected.

Students who are found to be not physically qualified for Coast Guard licensing just prior to graduation may be exempt from the requirement.

U. S. Coast Guard License as a Merchant Marine Officer

To qualify at graduation for certification by the University and for eligibility to take the Coast Guard examinations for Third Mate or Third Assistant Engineer, students must complete all academic degree requirements and successfully complete three summer training cruises. Students must also meet physical qualifications at the time of graduation; and participate in the Corps of Cadets in a satisfactory manner every semester while enrolled in a license-option program which will normally require eight long semesters and three summers. Participation in the Corps of Cadets will include the requirement to successfully complete mandatory non-credit training courses such as firefighting, first aid, CPR, and radar certification. U.S. Coast Guard evaluation, examination, and issuance fees will be charged over and above fees specified in the University Catalog. Students pursuing a license option will not be granted leaves of absence from the Corps of Cadets for any fall or spring semesters in which they are enrolled in the University prior to completion of eight fall and/or spring semesters in the Corps of Cadets and three summer training cruises. Students who are dropped from the Corps of Cadets for academic or disciplinary reasons, but are allowed to remain in the University, will normally be disenrolled from the license-option program and will not be reenrolled in a license-option program except under very special circumstances and after a careful review by the professional staff of the University. Under exceptional circumstances highly-qualified students may accelerate the program, but in no case will the program be completed in less than six long semesters and three summer cruises.

Student Incentive Payments

Students who enroll in a license-option program for the first time during a fall semester may be eligible for Student Incentive Payments (SIP) of \$750 per quarter provided through the Maritime Administration. Incentive payments are awarded to students based on competitive criteria that evaluate the student's potential for completing the degree program and license requirements and for a subsequent successful maritime career. If a SIP recipient is disenrolled from TAMUG, or found to be non-physically qualified, or found to not have an aptitude for naval service, the student will automatically be terminated from the SIP program and all payments will stop.

Enrollment in the SIP program requires the cadet to accept midshipman status and to apply for, and accept if tendered, a commission in the United States Naval Reserve/Merchant Marine Program (USNR/MMP). The cadet must also meet physical qualifications for commissioning at the time of graduation.

The Naval Reserve Commission

The maritime industry is considered a vital part of our national defense. The U.S. Navy provides active-duty commissioned officers and Chief Petty Officers who are well trained in naval procedures to provide instruction in naval operations, sea power, and how merchant vessels are capable of operating with the Navy during peacetime, national emergency, and war. This instruction is provided through the Naval Science curriculum required for all license-option cadets.

In addition, the Department of Naval Science prepares eligible cadets for eventual commissioning in the United States Naval Reserve/Merchant Marine Program (USNR/MMP). Cadets under this program who pass a Navy physical examination become Merchant Marine Midshipmen. Upon completion of the Naval Science courses, graduation from TAMUG, and successful completion of the U.S. Coast Guard licensing exam, the Midshipman will be commissioned as a restricted line officer with a merchant marine designator and the rank of Ensign in the USNR/MMP.

Individuals commissioned in the USNR/MMP must fulfill these obligations:

- Maintain the commission for six years.
- Sail on their applicable license at sea for four months each consecutive two-year period for eight years.
- Complete two weeks of active-duty training in the Navy every year for six years.
- Submit an annual report to the administrator of the USNR/MMP Program.

Active-duty service may be requested by the midshipman under this program. Midshipmen also have the option of applying for active-duty commissions in the Coast Guard, or commissions in the Army, Air Force, U.S. Health Service, or National Oceanographic and Atmospheric Administration (NOAA).

This program provides Merchant Marine Officers who are familiar with Naval procedures to the merchant marine industry. It also provides the individual USNR/MMP officers, when on active duty, the benefits and pay normally provided U.S. Navy officers.

The U.S. Coast Guard Commission

The U.S. Coast Guard MARGRAD program offers licensed graduates the opportunity to apply for direct reserve commissions involving extended active duty in the U.S. Coast Guard. Applications may be initiated during a cadet's final year prior to graduation in accordance with U.S. Coast Guard directives.

The U.S. Coast Guard Maritime Academy Reserve Training Program (MARTP) program allows Cadets to enlist as a seaman (E-3) in the Coast Guard Reserve at the end of his or her freshman or sophomore year and receive reserve pay for the time spent in drill, Montgomery GI Bill tuition benefits, and eligibility for Maritime Administration Student Incentive Pay (MARAD SIP). For information about this program, contact TAMUG Commandant's Office at (409) 740-4588.

The Naval Reserve Officers Training Corps (NROTC) Program

The Naval Reserve Officers Training Corps (NROTC) Program offers men and women an opportunity to qualify for a commission in the Navy while attending TAMUG. NROTC students are required to participate in the U.S. Maritime Service Corps of Cadets.

To become eligible for a commission, NROTC cadets must complete all requirements for a bachelor's degree as well as certain courses specified by the Navy. Students wear uniforms furnished by the Navy and participate in three summer training periods of four to six weeks on board Navy ships.

Students join the NROTC program as National Scholarship winners or as non-subsidized college program students. Applications for the National Scholarships can be obtained through a Navy recruiting office prior to the submission deadline of 30 January of the year for which the student is applying.

The Navy also has a two-year NROTC scholarship program which is open to college students who will complete their sophomore or third year in a five-year curriculum. College program cadets are encouraged to compete for a three-year NROTC scholarship.

All NROTC scholarships pay for full tuition, books, fees, and necessary supplies. All scholarship cadets and junior and senior level College Program cadets receive an allowance of \$100 per month and are paid during summer training periods.

Upon graduation, qualified NROTC cadets are commissioned as Ensigns in the Unrestricted Line, U.S. Navy. Scholarship cadets receive regular commissions and serve a minimum of four years of active duty. College program cadets receive reserve commissions with an active-duty commitment of three years.

The Naval Science staff advises and counsels cadets on academic, personal and naval career matters. Primary emphasis is placed on educational excellence to produce the highest quality Naval officers. Students wishing to discuss the NROTC program should contact the Naval Science Department at (409) 740-4594.

ACADEMIC CURRICULA

The following pages outline the academic curricula offered at Texas A&M University at Galveston.

Electives: Electives in humanities are to be chosen from fine arts, theater arts, humanities, foreign language, history, literature, philosophy, archaeology, or geography. Electives in social science are to be chosen from cultural anthropology, geography, political science, psychology, sociology, applied ethics, and economics.

The curricula of Marine Biology, Marine Biology License Option and Marine Fisheries are subject to the following rules and requirements:

Freshmen enter the Marine Biology Department under enrollment management guidelines with an entry level designation of MABL. Students who successfully complete the foundation courses may compete for admission to the degree sequence. Admission to the degree sequence may be limited by availability of instructional resources. Enrollment in 300 and 400 series courses will be restricted to those students who have moved from the entry level to the degree sequence at the end of the freshman year. Automatic admission to upper level (sophomore, junior, and senior) courses in the MARB, MARF, or MARB/LO curricula is contingent upon meeting all of the following requirements:

1. The student shall have completed all courses (or their equivalents) listed for the freshman year.
2. The student shall have earned at least a grade of C in BIOL 113, 114, 123, and 124 (students may not advance to BIOL 114 and 124 until a grade of C or better is earned in BIOL 113 and 123).
3. The student shall have compiled a minimum of a 2.75 grade point ratio.

Students who do not meet all of the above criteria will be evaluated individually by the Department, and only upon invitation of the Department, may advance into the MARB, MARF, or MARB/LO program. The criteria used to evaluate these students, in order of importance, will be:

1. GPR in all courses listed in criterion 1 above, and
2. GPR in all courses completed.

Transfer students must have a minimum GPR of 2.75 to be admitted to the Department. Transfer students with the required courses who meet the other criteria listed above, may be admitted directly into the MARB, MARF, or MARB/LO degree programs.

Preference for available seats in courses in the Department will be given to students who have been admitted to the degree program. If additional spaces are available, students from other departments for whom courses in the Department are on their program of study, and who meet the course prerequisites, may be enrolled.

It is the student's responsibility to satisfactorily complete prerequisite coursework before enrolling in more advanced courses.

Curriculum in Marine Biology (MARB)

The Marine Biology program provides an excellent education in the biological sciences through studies undertaken in a unique coastal environment. The curriculum offers broad training in general biology, while emphasizing the local flora and fauna in estuaries and the marine environment. Students receive hands-on field sampling experience. A strong preparation in English, mathematics, and the sciences is recommended.

Three options are offered. These are a vertebrate zoology option, a coastal and wetlands option, and a comprehensive biology option. Students will declare an option at the end of their curriculum sophomore year (i.e., when all freshman and sophomore courses have been completed) and will then be assigned to an advisor whose teaching and research activities lie within that option. Students are required to choose three electives from courses within their option and to choose two electives from among the other options. The electives must be five actual classes (problems courses excluded).

Students may choose to complete a minor in the College of Geosciences and Maritime Studies. All minors will require not less than 15 hours and not more than 18 hours in the discipline; at least six hours must be upper division courses in the discipline, and no more than six hours from the minor may be used to fulfill other requirements. Each student choosing to complete a minor must contact the department offering the minor to determine if specific courses are required.

FRESHMAN YEAR

Fall Semester	(Th-Pr)	Cr
BIOL 113	Introductory Biology†	(3-0) 3
BIOL 123	Introductory Biology Lab†	(0-3) 1
CHEM 101	Fundamentals of Chemistry I	(3-0) 3
CHEM 111	Fundamental of Chemistry Lab I	(0-3) 1
HIST 105	History of the U.S.	(3-0) 3
KINE 199	Required Physical Activity	(0-2) 1
MATH 151	Engineering Math	(3-0) 4
Total Hours		16

Spring Semester	(Th-Pr)	Cr
BIOL 114	Introductory Biology†	(3-0) 3
BIOL 124	Introductory Biology Lab†	(0-3) 1
CHEM 102	Fundamentals of Chemistry II	(3-0) 3
CHEM 112	Fundamentals of Chemistry Lab II	(0-3) 1
ENGL 104	Composition and Rhetoric	(3-0) 3
HIST 106	History of the U.S.	(3-0) 3
KINE 199	Required Physical Activity	(0-2) 1
MATH 166	Topics in Contemporary Math‡	(3-0) 3
Total Hours		18

SOPHOMORE YEAR

Fall Semester	(Th-Pr)	Cr
CHEM 227	Organic Chemistry I	(3-0) 3
CHEM 237	Organic Chemistry Lab I	(0-3) 1
KINE 199	Required Physical Activity	(0-2) 1
MARB 303	Biostatistics†§	(2-2) 3
PHYS 201	College Physics	(3-3) 4
POLS 206	American National Government	(3-0) 3
	Elective in Earth Science §	3
Total Hours		18

Curriculum in Marine Biology

Spring Semester	..... (Th-Pr)	Cr
CHEM 228	Organic Chemistry II	(3-0) 3
CHEM 238	Organic Chemistry Lab II	(0-3) 1
MARB 315	Natural History of Vertebrates†§	(3-3) 4
PHYS 202	College Physics	(3-3) 4
POLS 207	State and Local Government	(3-0) 3
	Elective in Social Science	3
Total Hours		18

JUNIOR YEAR

Fall Semester	..... (Th-Pr)	Cr
ENGL 301	Technical Writing	(3-0) 3
MARB 408	Marine Botany†	(3-3) 4
MARB 435	Invertebrate Zoology†	(3-3) 4
MARS 360	Biochemistry†	(3-0) 3
	Elective-Option†	3
Total Hours		17

Spring Semester	..... (Th-Pr)	Cr
MARB 301	Genetics†	(3-3) 4
MARB 310	Cell Biology†	(3-3) 4
	Elective-Option†	3
	Elective-Option†	4
	Elective in Humanities	3
Total Hours		18

SENIOR YEAR

Fall Semester	..... (Th-Pr)	Cr
MARB 481	Seminar in Marine Biology†	(1-0) 1
MARB 420	Physiology†	(3-3) 4
	Elective Option†	3
	Elective	3
	Elective in Social Science	3
	Elective-Option†	4
Total Hours		18

Spring Semester	..... (Th-Pr)	Cr
MARB 425	Marine Ecology†	(3-3) 4
KINE 199	Required Physical Activity	(0-2) 1
MARB 482	Seminar in Marine Biology	(1-0) 1
MARB 450	Developmental Biology†	(3-3) 4
	Elective in Humanities	3
	Elective	3
Total Hours		16

Total Curriculum Hours□ 139

NOTE: All electives must be chosen in consultation with, and approved by, the student's academic advisor.
See page 52 for a listing of course options for humanities and social sciences electives.

†—Indicates required courses in the Marine Biology major. These courses will be used to compute the major GPR.

‡—Other calculus, or logic elective may be substituted with approval.

§—These classes may be taken either sophomore year semester.

□—The total hours may be increased if the student is required to take a foreign language, pre-calculus, lower level English, or computer science.

ELECTIVE COURSES WITHIN OPTIONS—Coastal and Wetlands Option: • AGRO 310 Soils* • MARB 300 Scientific Methods • MARB 320 Marine Food Chains • MARB 336 Plant Physiology • MARB 430 Coastal Plant Ecology • MARB 431 Wetlands Ecology • MARB 436 Marine Biology of the Upper Texas Coast • MARS 306 Stratigraphy and Sedimentation • MARS 340 Geochemistry • OCNG 401 Intro. To Oceanography. ‡General Biology Option: • MARB 325 Biopaleontology • MARB 330 Physiological Ecology • MARB 412 Sociobiology of Reproduction • MICR 351 Microbiology. §Other Elective Courses: • MARB 305 Use of SAS in Marine Biology • MARB 410 Animal Behavior • MARB 350 Methods in Research Diving. Vertebrate Zoology Option: • MARB 311 Ichthyology • MARB 312 Field Ichthyology • MARB 335 Fish Physiology • MARB 400 Biology of Marine Mammals • WFSC 315 Herpetology* • WFSC 400 General Mammalogy* • WFSC 402 Ornithology* • WFSC 417 Biology of Fishes* • ZOOL 318 Chordate Anatomy.* —*Courses currently available only at TAMU-College Station.

To obtain a minor in Marine Biology, students must choose 15 to 18 hours from the following list of courses:

MARB 300 Scientific Methods • MARB 320 Food Chains • MARB 330 Physiological Ecology • MARB 400 Biology of Marine Mammals • MARB 408 Marine Botany • MARB 425 Marine Ecology • MARB 430 Coastal Plant Ecology • MARB 431 Wetlands Ecology • MARB 436 Marine Biology of the Upper Texas coast • MARB 481, 482 Seminar • MARB 489 Sp. Topics in Physiological Ecology of Marine Mammals • MARB 489 Sp. Topics in Population Dynamics • MARF 423 Mariculture • MARF 445 Marine Fisheries Management.

Curriculum in Marine Biology with a License Option

The Marine Biology License Option program allows the marine biology student to prepare for a career as an officer aboard a seagoing vessel by participating in the U.S. Maritime Service Corps of Cadets. The curriculum provides the basics of marine biology as well as courses leading toward licensing as a Third Mate of any gross tonnage upon oceans, steam, or motor vessels, in the U.S. Merchant Marine.

The Marine Biology License Option curriculum is an abbreviated version of the Marine Biology curriculum and is oriented toward field activities consistent with service aboard research vessels. Students who wish to attend a biologically-oriented graduate program, or are interested in the medical professions, are advised to take additional coursework in developmental biology, genetics, biochemistry, and physiology.

Freshmen enter the Marine Biology Department under enrollment management guidelines with an entry level designation of MABL. The rules and procedures for advancement to upper level coursework or for the admission of transfer students into the MARB/LO program are described on page 52.

Marine Biology/License Option majors must make a C or higher in BIOL 113, 123, 114, and 124 taken at TAMU or TAMUG or those which are transferred and substituted for courses in the degree plan.

FRESHMAN YEAR

Fall Semester	..... (Th-Pr)	Cr
BIOL 113	Introductory Biology†	(3-0) 3
BIOL 123	Introductory Biology Lab†	(0-3) 1
CHEM 101	Fundamentals of Chemistry I	(3-0) 3
CHEM 111	Fundamentals of Chemistry Lab I	(0-3) 1
HIST 105	History of the U.S.	(3-0) 3
KINE 199	Required Physical Activity	(0-2) 1
MATH 106	Plane and Spherical Trigonometry	(4-0) 4
NAUT 103	Maritime Orientation and Life Saving	(3-0) 3
Total Hours		19

Curriculum in Marine Biology/LO...continued

Spring Semester	..... (Th-Pr)	Cr
BIOL 114	Introductory Biology†	3
BIOL 124	Introductory Biol Lab†	1
CHEM 102	Fundamentals of Chemistry II	3
CHEM 112	Fundamentals of Chemistry Lab II	1
KINE 199	Required Physical Activity	1
MATH 151	Engineering Math	4
NAUT 203	Seamanship I	3
NAUT 204	Terrestrial Navigation	3
Total Hours		19

SUMMER SESSION—Ten weeks aboard the T/S TEXAS CLIPPER II

NAUT 200	Basic Communications, Navigation and Seamanship	4
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SOPHOMORE YEAR

Fall Semester (Th-Pr)	Cr
CHEM 227	Organic Chemistry I	3
CHEM 237	Organic Chemistry Lab I	1
HIST 106	History of the U.S.	3
KINE 199	Required Physical Activity	1
MARB 300	Scientific Methods†	2
NVSC 200	Merchant Marine Officer I	3
PHYS 201	College Physics	4
Total Hours		17

Spring Semester	..... (Th-Pr)	Cr
CHEM 228	Organic Chemistry II	3
CHEM 238	Organic Chemistry Lab II	1
ENGL 104	Composition and Rhetoric	3
KINE 199	Required Physical Activity	1
NAUT 301	Seamanship II	3
NAUT 303	Celestial Navigation	3
PHYS 202	College Physics	4
Total Hours		18

SUMMER SESSION—Ten weeks aboard the T/S TEXAS CLIPPER II

NAUT 300	Intermediate Communication, Navigation and Seamanship	4
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JUNIOR YEAR

Fall Semester (Th-Pr)	Cr
MARB 315	Vertebrate Zoology†	4
MART 302	Marine Cargo Operations I	4
NAUT 201	Naval Architecture I	4
NVSC 300	Merchant Marine Officer II	3
POLS 206	American National Government	3
Total Hours		18

Spring Semester	..... (Th-Pr)	Cr
MART 321	Maritime Law I	2
MART 406	Marine Cargo Operations II	4
METR 302	Weather Reports and Forecasting	3
NAUT 202	Naval Architecture II	3
NAUT 304	Electronic Navigation	3
	Elective in Humanities	3
Total Hours		18

SHORESIDE SUMMER

ECON 203	Principles of Economics	(3-0)	3
ENGL 301	Technical Writing	(3-0)	3
MARB 311	Ichthyology†	(3-3)	4
	Elective in Humanities		3
Total Hours			13

SENIOR YEAR

Fall Semester	.....	(Th-Pr)	Cr
MARB 303	Biostatistics†	(2-2)	3
MARB 310	Cell Biology†	(3-3)	4
NAUT 302	Seamanship III	(1-3)	2
NAUT 404	The Navigator	(2-3)	3
	Elective in Social Science	3
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Total Hours			18

Spring Semester	(Th-Pr)	Cr
MARB 435	Invertebrate Zoology†	(3-3)	4
MARB 425	Marine Ecology†	(3-3)	4
OCNG 401	Introduction to Oceanography	(3-0)	3
POLS 207	State and Local Government	(3-0)	3
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Total Hours			14

SUMMER SESSION—Ten weeks aboard the T/S TEXAS CLIPPER II

NAUT 400	Advanced Communications, Navigation and Seamanship	4
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Total Curriculum Hours	166
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Note: All electives must be chosen in consultation with, and approved by, the student's academic advisor.

See page 52 for a listing of course options for humanities and social sciences electives.

†—Indicates required courses in the Marine Biology License Option major. These courses will be used to compute the major GPR.

□—The total hours may be increased if the student is required to take a foreign language, pre-calculus, lower level English, or computer science.

◇—Must pass the United States Coast Guard examination for licensing.

Curriculum in Marine Engineering Technology (MARE)

The Marine Engineering Technology program is designed to prepare the student for a career as an engineering technologist in the maritime profession. The program is available in a License Option version for students who want to serve as an engineering officer aboard seagoing vessels and in a Non-License Option for students who want an education in maritime-related applied engineering but do not plan to serve at sea. The Marine Engineering Technology curriculum is a thermal power-oriented specialization of a classical Mechanical Engineering Technology program. A thorough preparation in mathematics, science, and basic engineering courses is the foundation for further study in ship propulsion plants and electrical power generation and distribution equipment. The License Option Program builds on a sound education with professional training obtained by participating in the U.S. Maritime Service Corps of Cadets.

Marine Engineering Technology focuses on power cycles, principles, and methods used to convert the energy in fossil fuels into useful power, and the selection and operation of the major components and support systems in the power cycle. Courses in marine engineering are supplemented with studies in naval architecture and maritime applica-

tion of electrical engineering fundamentals. The students' education is enhanced through the use of computer simulation of propulsion plants and direct operation of marine machinery aboard the University's training ship.

Participation in the USMS Corps of Cadets program builds on the Marine Engineering Technology curriculum with three summer cruises on the University's training ship and academic year training in first aid, marine firefighting, and shipboard maintenance.

Graduation requirements for the License Option version of the degree program include earning licensure as a Third Assistant Engineer on ocean-going steam or motor vessels of any gross tonnage and any power rating.◊

License Option Graduates can obtain employment with shipping firms in sea-going engineering positions or shore support positions that require the additional training and qualifications of the Coast Guard license. Both License and Non-License Option graduates can obtain employment in shipyards, with marine engineering consulting firms, electric power utilities, and other industries dealing with energy conversion processes, equipment selection and manufacture, or sales.

FRESHMAN YEAR

Fall Semester	..... (Th-Pr)	Cr
CHEM 101	Fundamentals of Chemistry I (3-0)	3
CHEM 111	Fundamentals of Chemistry Lab I (0-3)	1
ENDG 105	Engineering Graphics (0-6)	2
ENGL 104	Composition and Rhetoric (3-0)	3
KINE 199	Required Physical Activity (0-2)	1
MATH 150	Functions, Trigonometry and Linear Systems (3-2)	4
NAUT 103	Maritime Orientation and Lifesaving (2-3)	3

Total Hours 17

Spring Semester	..... (Th-Pr)	Cr
CHEM 102	Fundamentals of Chemistry II (3-0)	3
CHEM 112	Fundamentals of Chemistry Lab II (0-3)	1
ENGR 109	Engineering Problem Solving and Computing (2-3)	3
KINE 199	Required Physical Activity (0-2)	1
MARE 100	Marine Engineering Fundamentals (2-3)	3
MATH 151	Engineering Mathematics I (3-2)	4
PHYS 218	Mechanics (3-3)	4

Total Hours 19

SUMMER SESSION—Ten weeks aboard the T/S TEXAS CLIPPER II

MARE 200	Basic Operations† 4
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SOPHOMORE YEAR

Fall Semester (Th-Pr)	Cr
HIST 105	History of the U.S.‡ (3-0)	3
MARE 205	Engineering Mechanics I† (3-0)	3
MARE 303	Marine Thermodynamics I† (3-0)	3
MATH 161	Engineering Mathematics II (3-0)	3
PHYS 219	Electricity (3-3)	4

Total Hours 16

Spring Semester	..... (Th-Pr)	Cr
ENGL 203	Introduction to Literature (3-0)	3
MARE 180	Basic Machine Shop Techniques† (0-3)	1
MARE 203	Diesel Engine Technology† (2-3)	3
MARE 206	Engineering Mechanics II† (3-0)	3
MARE 209	Mechanics of Materials† (3-0)	3
MARE 280	Welding Techniques† (0-3)	1

MARE 295	Electromechanical Systems for Marine Tech.† (3-0)	3
Total Hours	.....	17

SUMMER SESSION—Ten weeks aboard the T/S TEXAS CLIPPER II

MARE 300	Intermediate Operations† 4
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JUNIOR YEAR

Fall Semester (Th-Pr)	Cr
KINE 199	Required Physical Activity (0-2)	1
MARE 207	Electrical Power I† (3-2)	4
MARE 304	Marine Thermodynamics & Heat Transfer† (3-2)	4
MARE 305	Fluid Mechanics Theory† (3-2)	4
MARE 309	Marine Construction Materials† (3-3)	4

Total Hours 17

Spring Semester	..... (Th-Pr)	Cr
ECON 203	Principles of Economics (3-0)	3
HIST 106	History of the United States‡ (3-0)	3
KINE 199	Required Physical Activity (0-2)	1
MARE 306	Electrical Power II† (2-2)	3
MARE 311	Steam Propulsion Plants† (2-2)	3
MARE 312	Diesel Propulsion Plants† (2-2)	3
POLS 207	State and Local Government (3-0)	3

Total Hours 19

SUMMER SESSION—Ten weeks aboard the T/S TEXAS CLIPPER II

MARE 400	Advanced Operations† 4
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SENIOR YEAR

Fall Semester (Th-Pr)	Cr
ENGL 301	Technical Writing (3-0)	3
MARE 307	Marine Electronics† (3-0)	3
MARE 401	Marine Auxiliary Systems† (2-2)	3
MARE 403	Marine Technology and the Environment† (3-0)	3
NVSC 200	Merchant Marine Officer I (3-0)	3
	Humanities Elective (3-0)	3

Total Hours 18

Spring Semester	..... (Th-Pr)	Cr
MARE 402	Shipboard Automation and Control† (3-0)	3
MARE 404	Marine Air Conditioning & Refrigeration† (3-0)	3
MARE 405	Fundamentals of Naval Architecture† (3-0)	3
MARE 406	Marine Engineering Technology Projects† (3-0)	3
POLS 206	American National Government (3-0)	3
	Social Science Elective (3-0)	3

Total Hours 18

Total Curriculum Hours◊ 153

NOTE: All electives must be chosen in consultation with, and approved by, the student's academic advisor. See page 52 for a listing of course options for humanities and social sciences electives.

†—Indicates required courses in the Marine Engineering License Option major. These courses will be used to compute the major GPR.

‡—The American history requirement may also be fulfilled by utilizing other American history courses offered at TAMUG, including HIST 370, 442 or 444. Students should consult their academic advisor.

◊—The total hours may be increased if the student is required to take a foreign language, pre-calculus, lower level English, or computer science.

◊—Must pass United States Coast Guard examination for licensing.

Marine Engineering Technology–Non-License Option

FRESHMAN YEAR

Fall Semester		(Th-Pr)	Cr
CHEM 101	Fundamentals of Chemistry I	(3-0)	3
CHEM 111	Fundamentals of Chemistry Lab I	(0-3)	1
ENDG 105	Engineering Graphics	(0-6)	2
ENGL 104	Composition and Rhetoric	(3-0)	3
ENGR 109	Engineering Problem Solving & Computing	(2-3)	3
KINE 199	Required Physical Activity	(0-2)	1
MATH 150	Functions, Trigonometry and Linear Systems	(3-2)	4
Total Hours			17
Spring Semester		(Th-Pr)	Cr
CHEM 102	Fundamentals of Chemistry II	(3-0)	3
CHEM 112	Fundamentals of Chemistry Lab II	(0-3)	1
KINE 199	Required Physical Activity	(0-2)	1
MARE 100	Marine Engineering Fundamentals†	(2-3)	3
MATH 151	Engineering Mathematics I	(3-2)	4
POLS 206	American National Government	(3-0)	3
PHYS 218	Mechanics	(3-3)	4
Total Hours			19

SOPHOMORE YEAR

Fall Semester		(Th-Pr)	Cr
HIST 105	History of the United States‡	(3-0)	3
MARE 205	Engineering Mechanics I†	(3-0)	3
MARE 303	Marine Thermodynamics I†	(3-0)	3
MATH 161	Engineering Mathematics II	(3-0)	3
PHYS 219	Electricity	(3-3)	4
Total Hours			16
Spring Semester		(Th-Pr)	Cr
ENGL 203	Introduction to Literature	(3-0)	3
MARE 180	Basic Machine Shop Techniques†	(0-3)	1
MARE 203	Diesel Engine Technology†	(2-3)	3
MARE 206	Engineering Mechanics II†	(3-0)	3
MARE 209	Mechanics of Materials†	(3-0)	3
MARE 280	Welding Techniques†	(0-3)	1
MARE 295	Electromechanical Systems for Marine Tech.†	(3-0)	3
Total Hours			17

JUNIOR YEAR

Fall Semester		(Th-Pr)	Cr
KINE 199	Required Physical Activity	(0-2)	1
MARE 207	Electrical Power I†	(3-2)	4
MARE 304	Marine Thermodynamics & Heat Transfer†	(3-2)	4
MARE 305	Fluid Mechanics Theory†	(3-2)	4
MARE 309	Marine Construction Materials†	(3-2)	4
Total Hours			17
Spring Semester		(Th-Pr)	Cr
ECON 203	Principles of Economics	(3-0)	3
HIST 106	History of the United States‡	(3-0)	3
KINE 199	Required Physical Activity	(0-2)	1
MARE 306	Electrical Power II†	(2-2)	3
MARE 311	Steam Propulsion Plants†	(2-2)	3
MARE 312	Diesel Propulsion Plants†	(2-2)	3
Total Hours			16

SENIOR YEAR

Fall Semester		(Th-Pr)	Cr
ENGL 301	Technical Writing	(3-0)	3
MARE 307	Marine Electronics†	(3-0)	3
MARE 401	Marine Auxiliary Systems†	(2-2)	3
MARE 403	Marine Technology and the Environment†	(3-0)	3
	Humanities Elective	(3-0)	3
Total Hours			15
Spring Semester		(Th-Pr)	Cr
MARE 402	Shipboard Automation and Control†	(3-0)	3
MARE 404	Marine Air Conditioning & Refrigeration†	(3-0)	3
MARE 405	Fundamentals of Naval Architecture†	(3-0)	3
MARE 406	Marine Engineering Technology Projects†	(3-0)	3
POLS 207	State and Local Government	(3-0)	3
	Social Science Elective	(3-0)	3
Total Hours			18
Total Curriculum Hours□			135

NOTE: All electives must be chosen in consultation with, and by, the student's academic advisor. See page 52 for a listing of course options for humanities and social sciences electives.

†—Indicates required courses in the Marine Engineering major. These courses will be used to compute the major GPR.

‡—The American history requirements may also be fulfilled by utilizing other American history courses offered at TAMUG, including HIST 370, 442, OR 444. Students should consult their academic advisor.

□—The total hours may be increased if the student is required to take a foreign language, pre-calculus, lower level English, or computer science.

Curriculum in Marine Fisheries (MARF)

The curriculum in marine fisheries provides educational opportunities in the biological sciences, with emphasis on principles of marine fisheries management. Ecology, taxonomy, zoogeography, culture, and general biology of commercial species are emphasized. Course offerings are structured to provide not only a strong basis of formal academic instruction but also considerable hands-on field and collection experience by taking advantage of the coastal location of the University. A strong preparation in the sciences is recommended.

Marine fisheries graduates are prepared to work as fishery managers or research biologists for state and federal agencies, ecological consulting firms, industry, and educational institutions. Qualified degree recipients may undertake postgraduate studies in resource management, mariculture, systematics, seafood technology, and fisheries economics.

Freshmen enter the Marine Biology Department under enrollment management guidelines with an entry level designation of MABL. The rules and procedures for advancement to upper level coursework or the admission of transfer students into the MARF program are described on page 52.

Marine Fisheries majors must make a C or higher in BIOL 113, 123, 114, and 124 taken at TAMU or TAMUG or those which are transferred and substituted for courses in the degree plan.

FRESHMAN YEAR

Fall Semester			
BIOL 113	Introductory Biology†	(Th-Pr)	Cr
BIOL 123	Introductory Biology Lab†	(3-0)	3
CHEM 101	Fundamentals of Chemistry I	(0-3)	1
CHEM 111	Fundamentals of Chemistry Lab I	(3-0)	3
HIST 105	History of the U.S.‡	(0-3)	1
KINE 199	Required Physical Activity	(3-0)	3
MATH 151	Engineering Math	(0-2)	1
		(3-2)	4
Total Hours			16
Spring Semester			
BIOL 114	Introductory Biology†	(Th-Pr)	Cr
BIOL 124	Introductory Biology Lab†	(3-0)	3
CHEM 102	Fundamentals of Chemistry II	(0-3)	1
CHEM 112	Fundamentals of Chemistry Lab II	(3-0)	3
ENGL 104	Composition and Rhetoric	(0-3)	1
HIST 106	History of the U.S.‡	(3-0)	3
KINE 199	Required Physical Activity	(3-0)	3
MATH 166	Topics in Contemporary Math §	(0-2)	1
		(3-0)	3
Total Hours			18

SOPHOMORE YEAR

Fall Semester			
CHEM 227	Organic Chemistry I	(Th-Pr)	Cr
CHEM 237	Organic Chemistry Lab I	(3-0)	3
ECON 202/203	Principles of Economics	(0-3)	1
KINE 199	Required Physical Activity	(3-0)	3
MARB 303	Biostatistics†	(0-2)	1
PHYS 201	College Physics	(2-2)	3
POLS 206	American National Government	(3-3)	4
		(3-0)	3
Total Hours			18

Spring Semester			
CHEM 228	Organic Chemistry II	(Th-Pr)	Cr
CHEM 238	Organic Chemistry Lab II	(3-0)	3
KINE 199	Required Physical Activity	(0-3)	1
MARB 311	Ichthyology†	(0-2)	1
MARB 315	Vertebrate Zoology†	(3-3)	4
PHYS 202	College Physics	(3-3)	4
Total Hours			17

JUNIOR YEAR

Fall Semester			
ENGL 301	Technical Writing	(Th-Pr)	Cr
MARB 312	Field Ichthyology†	(3-0)	3
MICR 351	Fundamentals of Microbiology†	(3-3)	4
		(3-3)	4
	Elective in Earth Sciences		3
	Elective in Humanities		3
Total Hours			17

Spring Semester			
MARB 301	Genetics†	(Th-Pr)	Cr
MARS 360	Biochemistry†	(3-3)	4
MARF	Directed Elective	(3-0)	3
		(3-3)	4
	Elective in Botany		4
	Elective in Humanities		3
Total Hours			18

SENIOR YEAR

Fall Semester			
MARB 435	Invertebrate Zoology†	(Th-Pr)	Cr
MARF/MARB 481	Seminar†	(3-3)	4
MARF 423	Mariculture†	(1-0)	1
POLS 207	State and Local Government	(3-3)	4
		(3-0)	3
	Elective in Social Science		3
Total Hours			15

Spring Semester			
MARB 420	Comparative Physiology†	(Th-Pr)	Cr
MARB 450	Developmental Biology†	(3-3)	4
MARF/MARB 482	Seminar†	(3-3)	4
MARF 445	Marine Fisheries Management†	(1-0)	1
		(2-2)	3
	Elective in MARF or MARB†		3
Total Hours			15

Total Curriculum Hours □ 134

NOTE: All electives must be chosen in consultation with, and approved by, the student's academic advisor.

See page 52 for a listing of course options for humanities and social sciences electives.

† Indicates required courses in the Marine Fisheries major. These courses will be used to compute the major GPR.

‡—The American history requirement may also be fulfilled by utilizing other American history courses offered at TAMUG, including HIST 370, 442 OR 444. Students should consult their academic advisor.

§—161, or other calculus, or logic elective, may be substituted with approval.

□—The total hours may be increased if the student is required to take a foreign language, pre-calculus, lower level English, or computer science.

Curriculum in Marine Sciences (MARS)

The Marine Sciences curriculum is the undergraduate degree program of the Department of Oceanography which, as a result of the 1994 merger of the Marine Sciences and Oceanography Departments, offers undergraduate degrees in Galveston and graduate degrees in College Station. The Marine Sciences program concentrates on the physical science of the marine, estuarine, and coastal environment. The coastal location of the campus enables students to acquire extensive hands-on field experience in addition to a solid base of academic instruction in chemistry, geology, physics, biology, and mathematics. Advanced work centers around four semesters of oceanography. Electives in the junior and senior year allow the student to obtain a broader background in ocean studies or to specialize, usually in the areas of environmental science, geology, or chemistry or to prepare for admission to graduate school or professional positions in industry or government.

The Marine Sciences graduate has a strong, well-rounded foundation in the quantitative physical sciences with considerable field and laboratory experience. With suitably chosen electives, graduates are qualified to enter M.S. or PH.D. programs in Oceanography or related disciplines, or alternatively to move directly into the employment market. Graduates go on to jobs in environmental monitoring, oceanographic instrumentation, pollution control, the offshore oil industry, and other fields requiring a general technical background. Many students also go on to careers in the Navy or with other government agencies.

FRESHMAN YEAR

Fall Semester	(Th-Pr)	Cr
BIOL 113	Introductory Biology	(3-0) 3
BIOL 123	Introductory Biology Lab	(0-3) 1
CHEM 101	Fundamentals of Chemistry I	(3-0) 3
CHEM 111	Fundamentals of Chemistry Lab I	(0-3) 1
KINE 199	Required Physical Activity	(0-2) 1
MATH 151	Engineering Mathematics I	(3-2) 4
POLS 206	American National Government	(3-0) 3

Total Hours 16

Spring Semester	(Th-Pr)	Cr
BIOL 114	Introductory Biology	(3-0) 3
BIOL 124	Introductory Biology Lab	(0-3) 1
CHEM 102	Fundamentals of Chemistry II	(3-0) 3
CHEM 112	Fundamentals of Chemistry Lab II	(0-3) 1
ENGL 104	Composition and Rhetoric	(3-0) 3
KINE 199	Required Physical Activity	(0-2) 1
MATH 161	Engineering Mathematics II	(3-0) 3

Total Hours 15

SOPHOMORE YEAR

Fall Semester	(Th-Pr)	Cr
CHEM 227	Organic Chemistry I	(3-0) 3
CHEM 237	Organic Chemistry Lab	(0-3) 1
OCNG 251	Oceanography†	(3-0) 3
OCNG 252	Oceanography Laboratory†	(0-2) 1
KINE 199	Required Physical Activity	(0-2) 1
MATH 251	Engineering Mathematics III	(3-0) 3
PHYS 218	Mechanics	(3-3) 4

Total Hours 16

Spring Semester	(Th-Pr)	Cr
CHEM 228	Organic Chemistry II	(3-0) 3
CHEM 238	Organic Chemistry Lab	(0-3) 1
CPSC 203	Introduction to Computing	(2-2) 3
KINE 199	Required Physical Activity	(0-2) 1
GEOL 104	Physical Geology	(3-3) 4
PHYS 219	Electricity	(3-3) 4

Total Hours 16

JUNIOR YEAR

Fall Semester	(Th-Pr)	Cr
ENGL 301	Technical Writing	(3-0) 3
GEOL 210	Marine Geography	(3-0) 3
HIST 105	History of the United States‡	(3-0) 3
MARS 440	Introduction to Chemical Oceanography†	(3-0) 3
	Elective in Humanities	3
	Professional Elective §	3

Total Hours 18

Spring Semester	(Th-Pr)	Cr
HIST 106	History of the United States‡	(3-0) 3
MARS 310	Field Methods in Marine Sciences†	(1-6) 3
MARS 375	Science of Fluids†	(3-0) 3
MARS 430	Introduction to Geological Oceanography†	(3-0) 3
	Professional Elective §	3

Total Hours 15

SENIOR YEAR

Fall Semester	(Th-Pr)	Cr
MARS 410	Introduction to Physical Oceanography†	(3-0) 3
MARS 481	Seminar†	(1-0) 1
METR 302	Weather Reports and Forecasting	(3-0) 3
	Elective in Social Science	3
	Professional Elective §	3
	Elective	3

Total Hours 16

Spring Semester	(Th-Pr)	Cr
POLS 207	State and Local Government	(3-0) 3
OCNG 420	Introduction to Biological Oceanography†	(3-0) 3
MARS 450	Electrical and Physical Measurements†	(2-3) 3
MARS 485	Problems†	(3-0) 3
	Elective in Humanities	3
	Professional Elective §	3

Total Hours 18

Total Curriculum Hours□ 130

NOTE: All electives must be chosen in consultation with, and approved by, the student's academic advisor. See page 52 for a listing of course options for humanities and social sciences electives.

†—Indicates required courses in the Marine Sciences major. These courses will be used to compute the major GPR. Also, if any upper level MARS or OCNG elective courses are taken, they will be used in the major GPR.

‡—The American history requirement may also be fulfilled by utilizing other American history courses offered at TAMUG, including HIST 370, 442 OR 444. Students should consult their academic advisor.

§—Professional Electives must be chosen from 300 or 400 level Science or Mathematics courses.

□—The total hours may be increased if the student is required to take a foreign language, pre-calculus, lower level English, or computer science.

Curriculum in Marine Sciences with a License Option

This program retains the basic physical science core of the Oceanography Department's Marine Sciences program but leads as well toward a license as a deck Officer in the United States Merchant Marine. The student who successfully completes the license program will be qualified to sit for the U.S. Coast Guard examination as a Third Mate of any gross tonnage upon oceans, steam, or motor vessels. Students combine a broad base of courses in physical science and mathematics and practical instruction in seamanship and navigation with upper-level oceanography courses chosen by the student.

The objective of the program is to provide students with a sound intellectual and educational background to function in a scientifically and technologically advanced society, while also providing the practical hands-on training needed for employment in the maritime industry. Graduates are particularly well qualified to serve on research vessels where an understanding of the scientific purpose of the voyage is required. Students who wish to enter a physical science graduate program will need to take additional course work in science and mathematics.

FRESHMAN YEAR

Fall Semester		(Th-Pr)	Cr
BIOL 113	Introductory Biology	(3-0)	3
BIOL 123	Introductory Biology Lab	(0-3)	1
HIST 105	History of the United States†	(3-0)	3
KINE 199	Required Physical Activity	(0-2)	1
MATH 151	Engineering Mathematics I	(3-2)	4
NAUT 103	Maritime Orientation and Lifesaving	(2-3)	3
POLS 206	American National Government	(3-0)	3
Total Hours			18
Spring Semester		(Th-Pr)	Cr
ENGL 104	Composition and Rhetoric	(3-0)	3
BIOL 114	Introductory Biology	(3-0)	3
BIOL 124	Introductory Biology Lab	(0-3)	1
KINE 199	Required Physical Activity	(0-2)	1
MATH 161	Engineering Mathematics II	(3-0)	3
NAUT 203	Seamanship I	(2-3)	3
NAUT 204	Terrestrial Navigation	(2-2)	3
Total Hours			17

SUMMER SESSION—Ten weeks aboard the T/S TEXAS CLIPPER II

NAUT 200	Basic Communications, Navigation and Seamanship	4
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SOPHOMORE YEAR

Fall Semester		(Th-Pr)	Cr
CHEM 101	Fundamentals of Chemistry I	(3-0)	3
CHEM 111	Fundamentals of Chemistry Lab I	(0-3)	1
KINE 199	Required Physical Activity	(0-2)	1
NAUT 201	Naval Architecture I	(3-2)	4
NVSC 200	Merchant Marine Officer I	(3-0)	3
PHYS 218	Mechanics	(3-3)	4
Total Hours			16
Spring Semester		(Th-Pr)	Cr
CHEM 102	Fundamentals of Chemistry II	(3-0)	3
CHEM 112	Fundamentals of Chemistry Lab II	(0-3)	1
KINE 199	Required Physical Activity	(0-2)	1
NAUT 202	Naval Architecture II	(3-0)	3
NAUT 303	Celestial Navigation	(2-3)	3

PHYS 219	Electricity	(3-3)	4
OCNG 401	Introduction to Oceanography	(3-0)	3
Total Hours			18

SUMMER SESSION—Ten weeks aboard the T/S TEXAS CLIPPER II

NAUT 300	Intermediate Communications, Navigation and Seamanship	4
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JUNIOR YEAR

Fall Semester		(Th-Pr)	Cr
ENGL 301	Technical Writing	(3-0)	3
CPSC 203	Introduction to Computing	(2-2)	3
GEOL 104	Physical Geology	(3-3)	4
MART 302	Marine Cargo Operations I†	(3-3)	4
GEOG 210	Marine Geography	(3-0)	3
Total Hours			17
Spring Semester		(Th-Pr)	Cr
MART 321	Maritime Law I†	(2-0)	2
MARS	Option†§		3
NAUT 301	Seamanship II	(2-3)	3
NAUT 304	Electronic Navigation	(2-2)	3
POLS 207	State and Local Government	(3-0)	3
	Elective in Humanities		3
Total Hours			17

SUMMER SESSION—Ten weeks aboard the T/S TEXAS CLIPPER II

NAUT 400	Advanced Communications, Navigation and Seamanship	4
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SENIOR YEAR

Fall Semester		(Th-Pr)	Cr
MARS 481	Seminar†	(1-0)	1
MARS	Option†§		3
MART 406	Marine Cargo Operations II†	(3-2)	4
NAUT 302	Seamanship III	(1-3)	2
NAUT 404	The Navigator	(2-3)	3
	Elective in Social Science		3
Total Hours			16
Spring Semester		(Th-Pr)	Cr
HIST 106	History of the United States ‡	(3-0)	3
MARS 310	Field Methods in Marine Sciences†	(1-6)	3
METR 302	Weather Reports and Forecasting	(3-0)	3
MARS	Option†§		3
	Elective in Humanities		3
Total Hours			15
Total Curriculum Hours□◇			146

Note: All electives must be chosen in consultation with, and approved by, the student's academic advisor.

See page 52 for a listing of course options for humanities and social sciences electives.

†—Indicates required courses in the Marine Sciences License Option major. These courses will be used to compute the major GPR. Also, if any upper level MARS or OCNG elective courses are taken, they will be used in the major GPR.

‡—The American history requirement may also be fulfilled by utilizing other American history courses offered at TAMUG, including HIST 370, 442 OR 444. Students should consult their advisor.

§—MARS option courses must be chosen from MARS 410, 420, 430, or 450.

□—The total hours may be increased if the student is required to take a foreign language, pre-calculus, lower level English, or computer science.

◇—Must pass United States Coast Guard examination for licensing.

Curriculum in Marine Transportation (MART)

This program combines studies in the humanities and sciences with instruction and training in maritime disciplines to provide the U.S. Maritime Service cadet with a broad-based education. The student who successfully completes the license program will be qualified to sit for the U.S. Coast Guard license examination as a Third Mate of any gross tonnage upon oceans, steam, or motor vessels. Students not seeking a license do not have to take the three summer cruises, therefore needing to complete only 130 semester hours.

FRESHMAN YEAR

Fall Semester	(Th-Pr)	Cr
CHEM 101	Fundamentals of Chemistry I	(3-0) 3
CHEM 111	Fundamentals of Chemistry Lab I	(0-3) 1
ENDG 105	Engineering Graphics	(0-6) 2
ENGL 104	Composition and Rhetoric	(3-0) 3
KINE 199	Required Physical Activity	(0-2) 1
MATH 106	Plane and Spherical Trigonometry	(4-0) 4
NAUT 103	Orientation and Lifesaving	(2-3) 3
Total Hours		17

Spring Semester	(Th-Pr)	Cr
KINE 199	Required Physical Activity	(0-2) 1
HIST 105	History of the U.S.†	(3-0) 3
MATH 151	Engineering Mathematics I	(3-2) 4
MARE 100	Marine Engineering Fundamentals	(2-3) 3
NAUT 203	Seamanship I†	(2-3) 3
NAUT 204	Terrestrial Navigation†	(2-2) 3
Total Hours		17

SUMMER SESSION—Ten weeks aboard the T/S TEXAS CLIPPER II

NAUT 200	Basic Communications, Navigation and Seamanship†	4
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SOPHOMORE YEAR

Fall Semester	(Th-Pr)	Cr
CPSC 203	Introduction to Computing	(3-0) 3
ECON 202	Principles of Economics	(3-0) 3
KINE 199	Required Physical Activity	(0-2) 1
METR 302	Weather Reports and Forecasting	(3-0) 3
PHYS 201	College Physics	(3-3) 4
NVSC 200	Merchant Marine Officer I	(3-0) 3
Total Hours		17

Spring Semester	(Th-Pr)	Cr
ECON 203	Principles of Economics	(3-0) 3
HIST 106	History of the U.S.†	(3-0) 3
KINE 199	Required Physical Activity	(0-2) 1
NAUT 301	Seamanship II†	(2-3) 3
NAUT 303	Celestial Navigation†	(2-3) 3
PHYS 202	College Physics	(3-3) 4
Total Hours		17

SUMMER SESSION—Ten weeks aboard the T/S TEXAS CLIPPER II

NAUT 300	Intermediate Communications, Navigation and Seamanship†	4
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JUNIOR YEAR

Fall Semester	(Th-Pr)	Cr
ECON 452	International Trade and Finance	(3-0) 3
MART 301	Ocean Transportation I†	(4-0) 4
MART 302	Marine Cargo Operations I†	(3-3) 4
NAUT 201	Naval Architecture I†	(3-2) 4
POLS 206	American National Government	(3-0) 3
Total Hours		18

Spring Semester	(Th-Pr)	Cr
MART 321	Maritime Law I†	(2-0) 2
MART 406	Marine Cargo Operations II†	(3-2) 4
NAUT 202	Naval Architecture II†	(3-0) 3
NAUT 304	Electronic Navigation†	(2-2) 3
ENGL 301	Technical Writing	(3-0) 3
POLS 207	State and Local Government	(3-0) 3
Total Hours		18

SUMMER SESSION—Ten weeks aboard the T/S TEXAS CLIPPER II

NAUT 400	Advanced Communications, Navigation and Seamanship†	4
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SENIOR YEAR

Fall Semester	(Th-Pr)	Cr
MART 421	Maritime Law II†	(3-0) 3
NAUT 302	Seamanship III†	(1-3) 2
NAUT 404	The Navigator†	(2-3) 3
	Elective in Humanities	3
	Elective in Math/Logical Reasoning §	3
Total Hours		14

Spring Semester	(Th-Pr)	Cr
MART 416	Port Operations†	(3-0) 3
MGMT 105	Introduction to Business	(3-0) 3
OCNG 401	Introduction to Oceanography	(3-0) 3
	Elective in Humanities	3
	Elective	3
Total Hours≈		15

Total Curriculum Hours□◇ 145

NOTE: All electives must be chosen in consultation with, and approved by, the student's academic advisor.

Approved electives include but are not limited to MART 304, 489; MARA 301, 401, 402; MARS 350, 405.

See page 52 for a listing of course options for humanities and social sciences electives.

†—Indicates required courses in the Marine Transportation major. These courses will be used to compute the major GPR.

‡—The American history requirement may also be fulfilled by utilizing other American history courses offered at TAMUG, including HIST 370, 442 OR 444. Students should consult their academic advisor.

§—To be chosen from MATH 166, any MATH course above the 151 level, or PHIL 240, 342. The student is advised to take MATH 161 if planning to attend graduate school.

□—The total hours may be increased if the student is required to take a foreign language, pre-calculus, lower level English, or computer science.

≈—Seniors should take their USCG exams by March of their spring semester.

◇—Must pass United States Coast Guard examination for licensing.

Curriculum in Maritime Administration (MARA)

This curriculum is designed to prepare the graduate for administrative work in marine and maritime industries and/or governmental organizations involved in coastal, marine and maritime activities. The curriculum provides a strong foundation in management, finance, business analysis, accounting, and economics. This business and administrative curriculum integrates courses that specialize in marine and maritime activities such as port operations, brokerage and chartering, maritime law, and inland waterways.

FRESHMAN YEAR

Fall Semester	(Th-Pr)	Cr
HIST 105	History of the U.S.‡	3
KINE 199	Required Physical Activity	1
MATH 166	Topics in Contemporary Math	3
NAUT 103	Maritime Orientation and Lifesaving	3
POLS 206	American National Government	3
Total Hours		13

Spring Semester	(Th-Pr)	Cr
ENGL 104	Composition and Rhetoric	3
HIST 106	History of the U.S.‡	3
KINE 199	Required Physical Activity	1
MARS 250	BASIC Programming	3
MATH 151	Engineering Mathematics I	4
	Elective in Science §	4
Total Hours		18

SOPHOMORE YEAR

Fall Semester	(Th-Pr)	Cr
ACCT 229	Introduction to Accounting†	3
ECON 202	Principles of Economics	3
ENGL 203	Introduction to Literature	3
KINE 199	Required Physical Activity	1
MART 301	Ocean Transportation I†	4
NAUT 201	Naval Architecture I	4
Total Hours		18

Spring Semester	(Th-Pr)	Cr
ACCT 230	Introduction to Accounting†	3
ECON 203	Principles of Economics	3
MARA 212	Business Law†	3
MART 304	Ocean Transportation II†	3
POLS 207	State and Local Government	3
	Elective in Humanities	3
Total Hours		18

JUNIOR YEAR

Fall Semester	(Th-Pr)	Cr
ACCT 315	Intermediate Accounting in the Corporate Environment†	3
BANA 303	Statistical Methods†	3
ECON 311	Money and Banking†	3
KINE 199	Required Physical Activity	1
MART 421	Maritime Law II†	3
MKTG 321	Marketing†	3
Total Hours		16

Spring Semester	(Th-Pr)	Cr
BANA 364	Operations Management†	3
ENGL 301	Technical Writing	3
FINC 341	Business Finance†	3
MARA 401	Brokerage and Chartering†	3
POLS 340	Introduction to Public Administration†	3
Total Hours		15

SENIOR YEAR

Fall Semester	(Th-Pr)	Cr
BANA 436	Decision Support Systems†	3
ECON 452	International Trade Theory and Policy†	3
MARA 402	Inland Waterways†	3
MARA 460	Management Systems and Control†	3
	Elective	2
	Elective in Science §	4
Total Hours		18

Spring Semester	(Th-Pr)	Cr
BANA 424	Economics of Transportation†	3
ECON 412	Public Finance†	3
MARA 435	Labor Law and Policy†	3
MARA 466	Management Policy†	3
MART 416	Port Operations, Administration and Economics†	3
Total Hours		15

Total Curriculum Hours □ 131

NOTE: All electives must be chosen in consultation with, and approved by, the student's academic advisor. See page 52 for a listing of course options for humanities and social sciences electives.

†—Indicates required courses in the Maritime Administration major. These courses will be used to compute the major GPR.

‡—The American history requirement may also be fulfilled by utilizing other American history courses offered at TAMUG, including HIST 370, 442 OR 444. Students should consult their academic advisor.

§—Four credit hours in introductory biology, chemistry, physics or geology, one credit hour which must be a laboratory.

□—The total hours may be increased if the student is required to take a foreign language, pre-calculus, lower level English, or computer science.

Curriculum in Maritime Systems Engineering (MASE)

The Maritime Systems Engineering program is a design-oriented structural/ocean engineering program with emphasis on steel and concrete structures, offshore and coastal structures, coastal engineering, and hydrodynamics. The primary objective of the Maritime Systems program is to provide educational opportunities for students whose interests and talents attract them to the opportunities of engineering in the ocean and marine fields. The program is designed to prepare students to achieve innovative and environmentally acceptable ways to continue the development of the promise of our harbors, coasts, and oceans.

In recognition of the breadth of ocean and marine fields, the Department of Maritime Systems Engineering has developed two integrated areas of study: Offshore Engineering and Coastal Engineering. The offshore engineering area of study addresses the design of marine structures; the calculation of wind and wave forces on marine structures; hydrodynamics; design criteria for marine structures; and ocean engineering technology. Coastal Engineering addresses the applied engineering technologies associated with the design, construction, operation, and maintenance of coastal structures and facilities including breakwaters, piers, wharves, channels, and pipelines. Coastal processes and water wave mechanics involving strong integration of structural, geotechnical, and construction are a strong theme of the program.

Since the design of coastal and offshore facilities or marine systems encompasses many engineering fields, it is essential that the program include the fundamentals of the physical sciences and mathematics, as well as the engineering aspects that constitute the design of marine facilities.

The program leading to a bachelor of science degree in Maritime Systems Engineering is accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology.

FRESHMAN YEAR

Fall Semester	(Th-Pr)	Cr
CHEM 101	Fundamentals of Chemistry I	3
CHEM 111	Fundamentals of Chemistry Lab I	1
ENDG 105	Engineering Graphics	2
ENGL 104	Composition and Rhetoric	3
HIST 105	History of the U.S.†	3
KINE 199	Required Physical Activity	1
MATH 151	Engineering Mathematics	4
Total Hours		17
Spring Semester	(Th-Pr)	Cr
CHEM 102	Fundamentals of Chemistry II	3
CHEM 112	Fundamentals of Chemistry Lab II	1
ENGR 109	Engineering Problem Solving and Computing	3
MATH 161	Engineering Mathematics II	3
PHYS 218	Mechanics	4
	Social Science Elective	3
Total Hours		17

SOPHOMORE YEAR

Fall Semester	(Th-Pr)	Cr
ENGL 203	Introduction to Literature	3
MASE 205	Engineering Mechanics I	3
MASE 303	Marine Thermodynamics I	3
MATH 251	Engineering Mathematics III	3
PHYS 219	Electricity	4
POLS 206	American National Government	3
Total Hours		19
Spring Semester	(Th-Pr)	Cr
MASE 206	Engineering Mechanics II	3
MASE 209	Mechanics of Materials	3
MATH 308	Differential Equations	3
ECON 203	Principles of Economics	3
CVEN 365	Intro. to Geotechnical Engineering	3
	Humanities Elective	3
Total Hours		18

JUNIOR YEAR

Fall Semester	(Th-Pr)	Cr
CVEN 311	Fluid Dynamics†	3
CVEN 345	Theory of Structures†	3
MASE 336	Flow Measurement Fundamentals†	3
KINE 199	Required Physical Activity	1
MASE 309	Marine Construction Materials	4
MASE 310	Engineering Analysis†	3
Total Hours		17
Spring Semester	(Th-Pr)	Cr
MASE 301	Dynamics of Waves and Structures†	3
OCEN 300	Ocean Engineering Wave Mechanics†	3
OCEN 462	Hydromechanics†	3
	Technical Electives §	6
Total Hours		16

SENIOR YEAR

Fall Semester	(Th-Pr)	Cr
MASE 483	Marine Foundation Analysis and Design†	4
ENGL 301	Technical Writing	3
MASE 411	Hydrodynamics of the Coastal Zone†	3
MASE 415	Marine Structures Design†	3
OCEN 400	Basic Coastal Engineering†	3
HIST 106	History of the U.S.‡	3
Total Hours		19
Spring Semester	(Th-Pr)	Cr
KINE 199	Required Physical Activity	1
MASE 401	Measurements in the Ocean†	3
MASE 405	Finite Element Analysis in Engineering Design†	3
MASE 407	Design of Ocean Engineering Facilities†	4
MASE 410	Measurements in the Ocean Lab†	1
POLS 207	State and Local Government	3
Total Hours		15
Total Curriculum Hours□		138

NOTE: All electives must be chosen in consultation with, and approved by, the student's academic advisor.

See page 52 for a listing of course options for humanities and social sciences electives.

†—Indicates required courses in the Maritime Systems Engineering major. These courses will be used to compute the major GPR.

‡—The American history requirement may be fulfilled by utilizing other American history courses offered at TAMUG, including 370, 442, or 444. Students should consult with their academic advisor.

α—The total hours may be increased if the student is required to take a foreign language, pre-calculus, lower level English, or computer science.

§—The technical electives must be approved by the department head or the undergraduate advisor.

Technical electives are chosen from the approved engineering design courses such as CVEN 344, CVEN 346, MASE 489, and other MASE 485 engineering design courses.

COURSE DESCRIPTIONS

All undergraduate courses offered at the University are described on the following pages and are listed by disciplines, arranged alphabetically.

The course numbering scheme is as follows: 100 to 199, courses primarily open to freshmen; 200 to 299, courses primarily open to sophomores; 300 to 399, courses primarily open to juniors; 400 to 499, courses primarily open to seniors.

Figures in parentheses following the number of the courses indicate the clock hours per week devoted to theory and practice, respectively. Theory includes recitations and lectures; practice includes work done in the laboratory, shop, drawing room, or field. The unit of credit is the semester hour, which involves one hour of theory, or from two to four hours of practice per week for one semester of 15 weeks.

When courses are cross-listed (e.g., offered as MARA 212 at TAMUG and MGMT 212 at TAMU), credit cannot be received for both courses.

Any course may be withdrawn from the semester or summer schedule if the number of registrants is too small to justify its being offered.

Accounting (ACCT)

229. INTRODUCTORY ACCOUNTING. (3-0). Credit 3. Analysis, recording and reporting of business transactions; partnership and corporation accounting; analysis and use of financial statements.

230. INTRODUCTORY ACCOUNTING. (3-0). Credit 3. Continuation of ACCT 229. Use of budgets; introduction to cost accounting; cost control techniques and methods of measuring performance. Prerequisite: ACCT 229.

315. INTERMEDIATE ACCOUNTING IN THE CORPORATE ENVIRONMENT. (3-0). Credit 3. Financial and managerial accounting in domestic and multinational corporations; revenue recognition, asset valuation, financing arrangements, budgeting, cost control, and business combinations. Prerequisite: ACCT 230.

Anthropology (ANTH)

h 202. INTRODUCTION TO ARCHAEOLOGY. (3-0). Credit 3. An introduction to the study of the human past through the retrieval, analysis, and interpretation of material remains.

S 210. SOCIAL AND CULTURAL ANTHROPOLOGY. (3-0). Credit 3. Evolution of cultures; differences, similarities, and effects of material and non-material culture on economic, social, and political organization.

Biology (BIOL)

113. INTRODUCTORY BIOLOGY. (3-0). Credit 3. Survey of structures and functions common to living forms in general. Principles of cell biology, regulation of growth and development, reproduction, evolution, and ecology. Laboratory (BIOL 123) is optional.

114. INTRODUCTORY BIOLOGY. (3-0). Credit 3. Survey of major groups of living forms; their special structures and functions which enable them to exist. Survey includes prokaryotes, fungi, lower and higher plants, animals, and humans. Laboratory (BIOL 124) is optional. Prerequisite: BIOL 113.

123. **INTRODUCTORY BIOLOGY LABORATORY.** (0-3). Credit 1. Laboratory supporting BIOL 113. Prerequisite: BIOL 113 or registration therein.

124. **INTRODUCTORY BIOLOGY LABORATORY.** (0-3). Credit 1. Laboratory supporting BIOL 114. Prerequisite: BIOL 113, 123.

Business Analysis (BANA)

303. **STATISTICAL METHODS.** (3-0). Credit 3. Collection, tabulation, and presentation of numerical data. Sampling, estimation of averages and variation, probability and error, hypothesis testing, and correlation. Prerequisite: ECON 203, MATH 151, 166.

364. **OPERATIONS MANAGEMENT.** (3-0). Credit 3. Concepts, issues and techniques used to plan, analyze, and control systems of production. Operational problems in producing goods and services. Prerequisite: BANA 303, field trip fee.

424. **ECONOMICS OF TRANSPORTATION.** (3-0). Credit 3. Historical development, structure, function, and regulation of highway, rail, water, pipeline, and air transportation systems. Application of economic concepts and principles to transportation development and operations. Prerequisite: ECON 203.

436. **DECISION SUPPORT SYSTEMS.** (3-0). Credit 3. Application of quantitative decision-making techniques to management decision problems. Planning, analysis, and control of operating systems in organizational settings. Prerequisites: BANA 303, senior classification or approval of MARA department head.

485. **PROBLEMS.** Credit 1-3 each semester. Directed study of selected problems in an area of business analysis not covered in other courses. Prerequisite: Approval of MARA department head.

Center for Academic Enhancement (CAEN)

101. **SUCCEEDING IN COLLEGE.** (2-0). Credit 2. A seminar course designed to introduce students to the resources, skills, and strategies needed to succeed in college.

Chemistry (CHEM)

101. **FUNDAMENTALS OF CHEMISTRY I.** (3-0). Credit 3. Introduction to modern theories of atomic structure and chemical bonding; chemical reactions; stoichiometry; states of matter; solutions; equilibrium; acids and bases; coordination chemistry. Prerequisite: Concurrent registration in CHEM 111 is suggested.

102. **FUNDAMENTALS OF CHEMISTRY II.** (3-0). Credit 3. Theory and applications of oxidation-reduction systems; thermodynamics and kinetics; complex equilibria and solubility product; nuclear chemistry; descriptive inorganic and organic chemistry. Prerequisites: CHEM 101, 111 or their equivalent. Concurrent registration in CHEM 112 is suggested.

111. **FUNDAMENTALS OF CHEMISTRY LABORATORY I.** (0-3). Credit 1. Introduction to methods and techniques of chemical experimentation; qualitative and semi-quantitative procedures applied to investigative situations. Prerequisite: CHEM 101 or registration therein.

112. **FUNDAMENTALS OF CHEMISTRY LABORATORY II.** (0-3). Credit 1. Introduction to analytical and synthetic methods and to quantitative techniques to both inorganic and organic compounds with emphasis on an investigative approach. Prerequisites: CHEM 101, 111; CHEM 102 or registration therein.

227. **ORGANIC CHEMISTRY I.** (3-0). Credit 3. Introduction to chemistry of compounds of carbon. General principles and their application to industrial and biological processes. Prerequisite: CHEM 102 OR 104. Concurrent registration in CHEM 237 is suggested.

228. **ORGANIC CHEMISTRY II.** (3-0). Credit 3. Continuation of CHEM 227. Prerequisite: CHEM 227. Concurrent registration in CHEM 238 is suggested.

237. **ORGANIC CHEMISTRY LABORATORY.** (0-3). Credit 1. Operations and techniques of elementary organic chemistry laboratory. Preparation, reactions and properties of representative organic compounds. Prerequisites: CHEM 112 or 114; CHEM 227 or registration therein.

238. **ORGANIC CHEMISTRY LABORATORY.** (0-3). Credit 1. Continuation of CHEM 237. Prerequisites: CHEM 237; CHEM 228 or registration therein.

316. **QUANTITATIVE ANALYSIS.** (2-0). Credit 2. Introduction to methods of chemical analysis. Chemical equilibrium. Prerequisite: CHEM 102 or 104.

318. **QUANTITATIVE ANALYSIS LABORATORY.** (0-3). Credit 1. Laboratory work consists of selected experiments in quantitative analysis designed to typify operations of general application; work is primarily volumetric with limited gravimetric experiments. Prerequisites: CHEM 112 or 114; CHEM 315 OR 316 or registration therein.

383. **CHEMISTRY OF ENVIRONMENTAL POLLUTION** (3-0). Credit 3. Chemical pollutants in the air, in water, and on land. Their generation, chemical reactivity, action on environment and disappearance through chemical mechanisms. Chemistry of existing pollution abatement. Prerequisite: CHEM 228 or equivalent.

485. **PROBLEMS.** Credit 1-4. Introduction to research, library, and laboratory work. Prerequisites: Senior classification; approval of MARS department head.

Civil Engineering (CVEN)

311. **FLUID DYNAMICS.** (3-0). Credit 3. Fluid properties; statics; kinematics; basic conservation principles of continuity, energy and momentum; similitude and hydraulic models; incompressible flow in pipes; fluid dynamic drag. Prerequisite: MARE 206 or equivalent.

344. **REINFORCED CONCRETE STRUCTURES.** (2-3). Credit 3. Analysis and design of reinforced concrete beams, columns, slabs, and footings using ultimate strength methods. Prerequisite: CVEN 345.

345. **THEORY OF STRUCTURES.** (3-0). Credit 3. Structural engineering—functions of structure, design loads, reactions and force systems. Analysis of statically determinate structures; including beams, trusses, and arches. Methods of determining deflections of structures. Influence lines and criteria for moving loads. Analysis of indeterminate structures; including continuous beams and frames. Prerequisite: MARE 209 or equivalent.

346. **STRUCTURAL STEEL DESIGN.** (2-3). Credit 3. Materials, types of members and typical arrangements. Design of tension members, compression members, beams, and beam columns. Design of bolted connections and welded connections. Theory and practice as indicated in typical current specifications. Prerequisite: CVEN 345.

365. **INTRODUCTION TO GEOTECHNICAL ENGINEERING.** (2-2). Credit 3. Physical properties of soils, classification systems, soil exploration, permeability, consolidation, compaction, and shear strength. Laboratory tests conducted to determine the physical and engineering soil properties needed for application in geotechnical engineering design.

483. **ANALYSIS AND DESIGN OF STRUCTURES.** (2-3). Credit 3. Overall procedure of analysis and design; including functions, loads, layouts of force systems; analysis, design drafting, specifications, cost comparisons, and maintenance as applied to typical simple bridge and building structures. Prerequisites: CVEN 344, 346, 365.

Computer Science (CPSC)

203. INTRODUCTION TO COMPUTING. (2-2). Credit 3. Algorithms, programs, and computers. Basic programming and program structure. Data representation. Computer solution of numerical and non-numerical problems using a high-level programming language, FORTRAN.

485. PROBLEMS. Credit 1-6. Permits work on special projects in computing science. Project must be approved by MARS department head. Prerequisite: Senior classification.

Developmental Studies (CAEX)

001. BASIC MATHEMATICAL SKILLS. Credit 0. Developmental instruction in mathematics; includes the integers and rational numbers and applications, exponents, polynomials, solution of equations, graphing, elementary geometry, and reasoning skills. May not be used for credit toward a degree.

002. BASIC WRITING SKILLS. Credit 0. Individualized instruction in English composition based on an analysis of the student's proofreading, revision, and editing skills; a programmed sequence of study and practice designed for improvement of writing performance through mastery of basic skills at word, sentence, paragraph, and multiparagraph levels. May not be used for credit toward a degree.

003. BASIC READING SKILLS. Credit 0. Individualized instruction in reading based on an analysis of the student's reading comprehension skills; study and practice of reading strategies designed to increase reading comprehension skills. May not be used for credit toward a degree.

Economics (ECON)

202. PRINCIPLES OF ECONOMICS. (3-0). Credit 3. Elementary principles of economics; the economic problem and the price system; theory of demand, theory of production and the firm, theory of supply; the interaction of demand and supply. Prerequisites: MATH 151, 166.

203. PRINCIPLES OF ECONOMICS. (3-0). Credit 3. Measurement and determination of national income, employment, and price; introduction to monetary and fiscal policy analysis; the effects of government deficits and debt, exchange rates, and trade balances. Prerequisite: ECON 202, MATH 151, 166 or approval of advisor.

311. MONEY AND BANKING. (3-0). Credit 3. Fundamental principles of money, credit, and banking; arbitrage conditions in domestic and international capital markets; theoretical and institutional analysis of money markets. Prerequisite: ECON 203.

412. PUBLIC FINANCE. (3-0). Credit 3. Economic role of governments; the choice of public sector output in a democracy and the effects of various taxes on resource allocation and income distribution. Prerequisites: ECON 202, senior classification.

452. INTERNATIONAL TRADE THEORY AND POLICY. (3-0). Credit 3. Basis for trade; theory of comparative advantage; determination of product and factor prices; gains from international trade; commercial policy and its implications for income distribution; concept of effective protection; market distortions, policy generated distortions and the arguments for tariffs. Prerequisite: ECON 203. Formerly ECON 321.

485. PROBLEMS. Credit 1-3. Research and design of specific problem areas approved on an individual basis with the intention of promoting independent study and to supplement existing course offerings. Results of study presented in writing. Prerequisite: Major or minor in MARS or Economics (TAMU) or approval of MARS department head.

Engineering Design Graphics (ENDG)

105. ENGINEERING GRAPHICS. (0-6). Credit 2. Graphical approach to the engineering design process as applied to products; methods of graphical communications, three-dimensional geometry, working drawings, data analysis, computer graphics, introduction to team dynamics, and creative problem solving. (ENGR 1204).

106. ENGINEERING DESIGN GRAPHICS. (0-6). Credit 2. Introduction to engineering design; product development and team dynamics using graphical methods and descriptive geometry. Spatial analysis of geometric elements, vectors, data analysis, and graphical applications to a variety of engineering areas. Prerequisite: ENDG 105.

Engineering (ENGR)

109. ENGINEERING PROBLEM SOLVING AND COMPUTING. (2-3). Credit 3. Professional ethics, registration, and disciplines in engineering; engineering problem-solving environments (economic, political, technical, social), requirements, and methodologies; FORTRAN programming on PCs, minis and mainframes. Prerequisites: Admission to engineering curriculum and background in trigonometry.

English (ENGL)

104. COMPOSITION AND RHETORIC. (3-0). Credit 3. Focus on referential and persuasive researched essays through the development of analytical reading ability, critical thinking and library research skills.

203. INTRODUCTION TO LITERATURE. (3-0). Credit 3. Exploration of literature by genre and/or theme; literary analysis and interpretation; intensive writing about literature. Prerequisite: ENGL 104.

212. SHAKESPEARE. (3-0). Credit 3. Exploration of selected works of Shakespeare. Prerequisite: ENGL 104.

222. WORLD LITERATURE. (3-0). Credit 3. Representative works in translation of major authors from A.D. 1500 to present from various cultures, including such authors as Cervantes, Molière, Goethe, Tolstoy, Mahfouz, Munif, Achebe, Tolstaya, Vargas Llosa, and Duras. Prerequisite: ENGL 104.

228. AMERICAN LITERATURE: CIVIL WAR TO PRESENT. (3-0). Credit 3. Expressions of the American experience in realism, regionalism and naturalism; varieties of modernist and contemporary writing; the rise of ethnic literature and experimental literary forms; includes such writers as Dickinson, Twain, James, Crane, Frost, Eliot, Fitzgerald, Hemingway, Faulkner, O'Neill, Baldwin, and Rich. Prerequisite: ENGL 104.

251. THE LANGUAGE OF FILM. (2-2). Credit 3. Development of the language of film: major movements, representative works, theory and techniques; lecture/discussion following film screenings. Prerequisite: ENGL 104.

301. TECHNICAL WRITING. (3-0). Credit 3. Advanced writing in technical, scientific, and business fields; reports, proposals, and other papers; correspondence. Prerequisite: ENGL 104; junior classification in the major department, or approval of instructor.

334. SCIENCE FICTION PAST AND PRESENT. (3-0). Credit 3. Origins and development of the science fiction genre, including such authors as Wells, Lewis, Clarke, Miller, and Le Guin. Prerequisite: ENGL 104.

335. LITERATURE OF THE SEA. (3-0). Credit 3. Significance of the sea in fictional and factual accounts, such as novels, short stories, poems, and narratives of sailors and seafaring life. Prerequisite: 3 credits of literature at 200 level or above.

374. WOMEN WRITERS. (3-0). Credit 3. History of literature by women in English, primarily from the 16th century to the present; emphasis on continuity of ideas and on literary contributions; study of poetry, essays, novels, short stories, with particular attention to characteristic themes and to racial, social, cultural diversity of women writing in English. Prerequisite: English 104.

485. PROBLEMS. Credit 1-3. Readings selected for specific need of major or minor in English.

Finance (FINC)

341. BUSINESS FINANCE. (3-0). Credit 3. Financial practices and financial management of modern business corporations; cash flow, planning, procurement of funds, management of long-term funds and working capital. Prerequisites: ECON 203 and ACCT 229 or equivalent and junior classification.

French (FREN)

101. BEGINNING FRENCH I. (3-2). Credit 4. Elementary language study with oral, written, and reading practice. Preparation for conversation. Part of class preparation will be done in language laboratory.

102. BEGINNING FRENCH II. (3-2). Credit 4. Continuation of FREN 101. Part of class preparation will be done in language laboratory. Prerequisite: FREN 101.

Geography (GEOG)

201. INTRODUCTION TO HUMAN GEOGRAPHY. (3-0). Credit 3. A survey of the major systems of man-land relations of the world and their dissimilar developments. The processes of innovation, diffusion, and adaptation stressed with regard to changing relationships between people and their environment.

210. MARINE GEOGRAPHY. (3-0). Credit 3. Introduction to the physical and cultural patterns of the coastal zones of the world. Interrelationships between the physical forms and processes and the cultural patterns used to analyze human use and abuse of the sea.

301. GEOGRAPHY OF THE UNITED STATES. (3-0). Credit 3. Geographic personality (physical and cultural) of the United States. Note: To be used as a humanities elective for any degree program.

Geology (GEOL)

101. PRINCIPLES OF GEOLOGY. (3-3). Credit 4. General principles of physical geology; structure of the Earth, origins of minerals and rocks, and geologic processes; synthesis of geologic ideas and introduction to geologic practice. Does not involve rigorous mathematical or chemical treatment of the subjects but may be used for the fulfillment of laboratory science requirements. Not open to students who have taken GEOL 103 OR 104.

104. PHYSICAL GEOLOGY. (3-3). Credit 4. Earth materials, structures, external and internal characteristics; physical processes at work upon or within the planet. A working knowledge of high school chemistry and mathematics is required.

305. INVERTEBRATE PALEONTOLOGY. (2-3). Credit 3. Analysis of history of life and processes controlling it; study of groups of organisms important in the marine fossil record; application of paleontology to geologic problems. Field trips may be required. Prerequisite: GEOL 104 or approval of department head.

320. GEOLOGY FOR CIVIL ENGINEERS. (2-3). Credit 3. Principles of physical geology;

common minerals and rocks with their relationships and applications to construction, foundations and excavation. Prerequisite: Sophomore classification.

485. PROBLEMS. Credit 1-3. Advanced problems in geology. Prerequisite: Approval of department head.

History (HIST)

105. HISTORY OF THE UNITED STATES. (3-0). Credit 3. Colonial Heritage; revolution; adoption of Constitution; growth of nationalism and sectionalism; Civil War; reconstruction.

106. HISTORY OF THE UNITED STATES. (3-0). Credit 3. Since reconstruction; new social and industrial problems; rise of progressivism; U.S. emergence as a world power; World War I; reaction and New Deal; World War II; contemporary America.

226. HISTORY OF TEXAS. (3-0). Credit 3. History of Texas from Spanish period to present day. Stress placed upon period of Anglo-American settlement, revolution, republic, and development of modern state.

232. HISTORY OF AMERICAN SEA POWER. (3-0). Credit 3. Development of American sea power from the 18th century to the present.

370. CIVIL WAR AND RECONSTRUCTION. (3-0). Credit 3. Survey of background and causes of the war; military, political, economic, and diplomatic aspects of the war; life behind the lines; reconstruction and post-war adjustments, 1861-1877.

373. THE GREAT DEPRESSION AND WORLD WAR II. (3-0). Credit 3. The United States, 1929-1945; cultural, social, economic, and political developments in the nation; global diplomacy and military strategy.

374. THE UNITED STATES AFTER WORLD WAR II. (3-0). Credit 3. The United States since World War II; political, economic, cultural, and social changes and role as a world leader.

485. PROBLEMS. Credit 1-3. Selected fields of history not covered in depth by other courses. Reports and extensive reading required. Prerequisite: Approval of department head.

489. SPECIAL TOPICS IN HISTORY. Credit 1-4. Selected topics in an area of history.

Kinesiology (KINE)

199. REQUIRED PHYSICAL ACTIVITY. (0-2). Credit 1. May be repeated for credit each semester.

Management (MGMT)

105. INTRODUCTION TO BUSINESS. (3-0). Credit 3. Survey of economic systems, forms of business ownership and running the small business; organizing and managing businesses; managing human resources; managing production and information; managing marketing; introducing financial issues including accounting, money, and banking, securities markets; business issues and challenges including legal and regulatory environment, business ethics, and international business.

Marine Biology (MARB)

300. SCIENTIFIC METHODS IN MARINE BIOLOGY. (1-3). Credit 2. An introduction to field, laboratory and analytical methods, equipment and instruments. The field portion will include making proper observations, sampling techniques, and data recording. The

laboratory portion will include sample analysis methods, use of instruments, introduction to data analysis including elementary statistics, introduction to scientific literature and report writing style. Prerequisites: BIOL 113, 114, 123, 124; curriculum sophomore or approval of instructor.

301. GENETICS. (3-3). Credit 4. Fundamental principles of genetics; physical basis of Mendelian inheritance; expression and interaction of genes, linkage, sex linkage, biochemical nature of genetic material, and mutation. Prerequisites: MARS 360; CHEM 227, 228, 237 and 238; curriculum sophomore or approval of instructor.

303. BIOSTATISTICS. (2-2). Credit 3. Introduction to sampling, experimental design, analysis of data, and testing of hypotheses, with emphasis on methods applied to biological investigations. Parametric and non-parametric techniques. Descriptive statistics, analysis of variance, correlation and regression. Prerequisites: MATH 131, three credit hours of computer science, curriculum sophomore or approval of instructor.

310. INTRODUCTION TO CELL BIOLOGY. (3-3). Credit 4. Cellular structure/function; procaryotic vs. eucaryotic cells. Examination of cellular membranes and membrane transport. Analysis of DNA replication, transcription, and protein translation (an extension of their treatment in MARB 301). Introduction to the components and genetics of immunology. Cell Biology should precede or be concurrent with enrollment in MARB 450. Prerequisites: BIOL 114, CHEM 228, MARB 301, MARS 360, curriculum junior or approval of instructor.

311. ICHTHYOLOGY. (3-3). Credit 4. Freshwater and marine fishes. Subject will be mainly systematic, but evolution, ecology, life history, and economics of more important species will be treated. Prerequisites: BIOL 114, 124, curriculum sophomore or approval of instructor.

312. FIELD ICHTHYOLOGY. (3-3). Credit 4. Field and laboratory studies on identification and ecology of freshwater and marine fishes of Texas. Field trips required. Prerequisite: MARB 311, curriculum sophomore or approval of instructor.

315. NATURAL HISTORY OF VERTEBRATES. (3-3). Credit 4. Natural history of fishes, amphibians, reptiles, birds, and mammals, with emphasis on coastal Texas vertebrates. Prerequisites: BIOL 114, 124, curriculum sophomore or approval of instructor.

320. MARINE FOOD CHAINS. (2-3). Credit 3. Examination of basic food chain concepts, including ecosystem roles, trophic levels and structure, energy and energy flows, and biogeochemical cycles. Methods of marine food chain analysis are considered in detail as well as exemplary marine food chain studies reported in the literature. Prerequisites: BIOL 114, 124, curriculum junior or approval of instructor.

325. BIOSPELEOLOGY. (3-3). Credit 4. A field-oriented introduction to the biology of aquatic and terrestrial cave organisms with discussions on the origin of caves, cave environment, cave fauna, and evolution. Field trips required. Prerequisites: BIOL 114, CHEM 101, GEOL 104 or approval of instructor.

330. PHYSIOLOGICAL ECOLOGY. (3-0). Credit 3. Examination of how ecological pressures dictate individual and interorganismal physiological processes that lead to individual and community adaptation. Discussion of the physiological interrelationships between members of an ecological community. Attention will be directed toward physiological systems of plants and animals. Prerequisites: BIOL 113, 114, 123, 124 or approval of instructor.

335. FISH PHYSIOLOGY. (3-0). Credit 3. Study of the basic physiology of fishes. Examination of fish cardiovascular, renal, digestive, locomotor, reproductive, and central/per-

ipheral nervous systems. Discussion of physiological adaptations enhancing survival in a water medium. Prerequisite: BIOL 113, 114, 123, 124 or MARB 311 or equivalent or approval of instructor.

350. METHODS IN RESEARCH DIVING. (3-2). Credit 3. Survey of research methods and techniques using diving. Lecture and lab designed train students in safe, efficient use of diving to collect and record data underwater for studies primarily in biology, geology, and archaeology. Prerequisites: BIOL 114, CHEM 101, PHYS 201 or approval of instructor.

400. BIOLOGY OF MARINE MAMMALS. (3-3). Credit 4. A broad-spectrum course on the taxonomy, evolution, morphology behavior, and ecology of marine mammals, including sirenians, carnivores, baleen and toothed whales and dolphins. Prerequisite: BIOL 113, 114, 123, 124, MARB 315, 410; or approval of instructor.

408. MARINE BOTANY. (3-3). Credit 4. Morphology, systematics, ecology, and biochemistry of representative algae, fungi, and submarine grasses. Prerequisites: BIOL 114, 124, curriculum sophomore or approval of instructor.

410. ANIMAL BEHAVIOR. (2-3). Credit 3. Examination of ethological concepts. Discussion of the development, genetics, physiology, and evolution of animal behavior patterns involved in reproduction, territoriality, aggression, communication, population dispersion, sociality, and sociobiology of invertebrates and vertebrates. Prerequisites: BIOL 114, 124, curriculum sophomore or approval of instructor.

412. SOCIOBIOLOGY OF REPRODUCTION. (3-0). Credit 3. Application of sociobiological concepts to examine the evolution and adaptive significance of reproductive strategies utilized by marine and terrestrial animals. Strategy-influencing factors to be discussed include: mate selection and competition, sex roles, bonding, parental investment in offspring, and socialization. Prerequisites: Biology 114, MARB 301 or equivalent, or registration therein, curriculum sophomore or approval of instructor.

420. COMPARATIVE ANIMAL PHYSIOLOGY. (3-3). Credit 4. Principles of animal physiology are examined using invertebrate and vertebrate model systems. Topics include osmoregulation in marine vs. freshwater vs. terrestrial organisms, excretion, fluid circulation, nervous system structure and function, muscle activity, sensory neurobiology, and endocrine mediation. Prerequisites: BIOL 114, CHEM 228, MARB 310, MARS 360, curriculum junior or approval of instructor.

425. MARINE ECOLOGY. (3-3). Credit 4. Relationship between various marine environments and their inhabitants; intra- and interspecific relationships between organisms; structure and function among marine communities. Laboratory emphasis is placed on study of living material and natural habitats in the Gulf of Mexico. Prerequisites: MARB 315, 408, 435; ENGL 301; curriculum senior or approval of instructor.

430. COASTAL PLANT ECOLOGY. (3-3). Credit 4. Study of the identification, distribution, production, and ecological importance of estuarine, coastal marsh, and dune vascular plants; the interaction of plants with their abiotic and biotic environments; and techniques of vegetation management and evaluation. Prerequisite: BIOL 114, curriculum junior or approval of instructor.

431. WETLANDS ECOLOGY, MONITORING AND DELINEATION. (2-6). Credit 4. Study of the characteristics and importance of wetlands and methods for delineating, monitoring, and evaluating wetlands. Students will become knowledgeable in wetland soils, plants, ecological interactions of wetlands and other habitats and animals, and the laws pertaining to obtaining permits and managing wetlands of the U.S. Prerequisites: BIOL 113, 114, 123 and 124 or approval of instructor.

435. **INVERTEBRATE ZOOLOGY.** (3-3). Credit 4. General biology of marine invertebrate animals; morphology, evolution, and systematics. Laboratory will stress studies of local fauna. Prerequisites: BIOL 113, 114, 123, 124, curriculum junior or approval of instructor.

436. **MARINE BIOLOGY OF THE UPPER TEXAS COAST.** (3-3). Credit 4. Survey of the principles of physical, chemical, geological, and biological oceanography as applied to the northern Gulf of Mexico. Galveston Bay and adjacent offshore waters will provide examples. Prerequisites: Curriculum sophomore or approval of instructor.

440. **MARINE BIOLOGY.** (3-3). Credit 4. Introduction to biology of common organisms inhabiting bays, beaches and near-shore oceanic waters, with special reference to Gulf of Mexico biota. Lectures, laboratory studies, and field trips will emphasize classification and economic aspects of marine organisms. A survey course, not intended for use in the Marine Biology curriculum. Prerequisites: BIOL 113, 114, 123, 124; curriculum junior or approval of instructor.

450. **DEVELOPMENTAL BIOLOGY OF MARINE ORGANISMS.** (3-3). Credit 4. Patterns and mechanisms of development in animal embryos (from sea urchins to mammals) at the molecular, cellular, and tissue levels. Emphasis on cellular differentiation via gene expression. Laboratory includes fixed sections and observations of live animals. Prerequisites: BIOL 113-124; curriculum junior or approval of instructor. Completion of MARB 301 is recommended. Completion or enrollment in MARB 310 is recommended.

466. **EVOLUTIONARY BIOLOGY.** (3-0). Credit 3. A conceptual examination of evolutionary theory, not a survey of specific organismal evolutions. Evidence for the abiotic origin of life is presented, followed by a discussion of micro-evolutionary (including drift and natural selection) and macro-evolutionary (including evolutionary trends) mechanisms. The course concludes with application of these concepts to human evolution. Prerequisites: BIOL 113 and 114. MARB 301 is recommended but not required.

481. **SEMINAR IN MARINE BIOLOGY.** (1-0). Credit 1. Critique of articles from the current biology literature. Emphasis placed on evaluation of methods and results reported in scientific papers. Prerequisites: Curriculum junior or approval of instructor.

482. **SEMINAR IN MARINE BIOLOGY.** (1-0). Credit 1. Compilation of literature pertaining to topics in marine biology. Emphasis placed on preparation of a written report and presentation of a synopsis of that report. Prerequisites: Curriculum junior or approval of instructor.

485. **PROBLEMS IN MARINE BIOLOGY.** Credit 1-6 per semester. Special topics and problems in field and/or laboratory work suited to analysis by individuals or small groups concerning aspects of marine biology. Usually requires a report describing techniques and results. Only 3 credit hours may be used in the degree plan curriculum. Prerequisites: 2.25 GPR, curriculum sophomore and approval of instructor.

489. **SPECIAL TOPICS IN MARINE BIOLOGY.** Credit 1-4. Study of selected topics in an identified area of marine biology. Prerequisite: Curriculum junior or approval of instructor.

Marine Engineering Technology (MARE)

100. **MARINE ENGINEERING FUNDAMENTALS.** (2-3). Credit 3. A study of basic marine engineering systems, with emphasis on propulsion plants. Introduction to propulsion plant machinery, watchstanding organization and duties, shipboard safety practices and equipment.

180. **BASIC MACHINE SHOP TECHNIQUES.** (0-3). Credit 1. Safety, care of machines and hand-tools, cutting speeds and feeds, measuring instruments, gauging, standard machine

tool work in metals, layouts, drilling, tapping, threading, vertical and horizontal milling and shaving.

200. **BASIC OPERATIONS.** Credit 4. Practical application of student's classroom studies while at sea on training ship during sea-training period. Student required to complete several projects relating to engineering plant of ship. Prerequisite: NAUT 103.

203. **DIESEL ENGINE TECHNOLOGY.** (2-3). Credit 3. Basic principles of two- and four-stroke diesel engines; intake, scavenging and exhaust systems, injection systems; starting and reversing methods; cooling and lubricating systems; engine room layout in modern motor vessels.

207. **ELECTRICAL POWER I.** (3-3). Credit 4. Application of electromagnetic principles to AC and DC circuits including: batteries, DC motors and generators, AC motors and generators, balanced three-phase systems, transformers, and electrical instruments. Prerequisite: PHYS 219.

280. **WELDING TECHNIQUES.** (0-3). Credit 1. To introduce students to the materials, equipment and techniques of welding and brazing and to develop skills required by the marine engineer for this work in the engine room of commercial ships.

295. **ELECTROMECHANICAL SYSTEMS FOR MARINE TECHNOLOGISTS.** (3-0). Credit 3. Practical solutions of physical models of electromechanical systems; steady state and transient response of linear electrical and mechanical systems; elements of periodic and random excitations and techniques for practical solutions; computer modeling of elementary continuous systems. Prerequisites: MATH 161 and PHYS 218; PHYS 219 or registration therein.

300. **INTERMEDIATE OPERATIONS.** Credit 4. Training program for second sea-training period. Sea project required of each student under supervision of officer-instructors. Lifeboat and safety training.

304. **MARINE THERMODYNAMICS & HEAT TRANSFER.** (3-2). Credit 4. Advanced topics in gas dynamics: flow through nozzles and through compressor and turbine blades, compressible duct flow with friction. Study of gas mixtures and chemical combustion. Thermodynamics of propulsion systems, elements of heat transfer and heat exchanger analysis. Prerequisite: MARE 303.

305. **FLUID MECHANICS THEORY.** (3-2). Credit 4. Theory of incompressible and compressible fluid flow, introduction to fluid power systems and controls, and dynamics of turbomachinery. Mathematical analysis of piping systems to determine pump head, system resistance, and pipe sizing optimization. Topics include physical properties of fluids, continuity equation, Bernoulli's Equation, Darcy's Equation, series and parallel flow, relative roughness, friction factors, dimensional analysis, and laws of similitude.

306. **ELECTRICAL POWER II.** (2-2). Credit 3. Shipboard electric power generation and distribution; switchboard instrumentation, controls and safety devices; motor controllers and safety devices; operation, maintenance and repair procedures and practices. AC and DC electric ship propulsion systems. Prerequisite: MARE 207.

307. **MARINE ELECTRONICS.** (3-0). Credit 3. Introduction to the theory of electronic circuits. Fundamentals and basic concepts of semiconductors; solid-state components; power supplies; amplifiers; inverters; rectifiers; oscillators; digital and linear integrated circuits. Applications in automation, motor controllers, battery-charging systems, communications, and propulsion plant performance monitoring systems.

311. **STEAM PROPULSION PLANTS.** (2-2). Credit 3. Comprehensive study of fossil fuel steam generators, propulsion turbines and condensers, reduction gears, line shafting. Studies

include internal fittings and fluid flow paths, automatic controls; regulatory requirements for safety device settings, and system tests and inspections. Additional topics include boiler water-feed water test and treatment, and turbine/reduction gear lubrication. Laboratory includes computer-aided heat balance and parametric analysis of plant performance. Prerequisite: MARE 304, 305.

312. DIESEL PROPULSION PLANTS. (2-2). Credit 3. Comprehensive study of diesel propulsion plants, including direct-drive low speed diesels, geared medium speed diesels, waste heat recovery systems, engine reversing methods, and heavy fuel processing. Laboratory includes computer-aided parametric analysis of engine performance and use of a low-speed diesel propulsion plant simulator. Prerequisite: MARE 304, 305.

395. ELECTROMECHANICAL SYSTEMS FOR TECHNOLOGISTS. (3-0). Credit 3. Practical solutions of physical models of electromechanical systems; steady state and transient response of linear electrical and mechanical systems; elements of periodic and random excitations and techniques for practical solutions; computer modeling of elementary continuous systems. Prerequisite: MATH 161, PHYS 218, 219.

400. ADVANCED OPERATIONS. Credit 4. Training program for third sea-training period. At the end of this period each student will have achieved the knowledge and will have demonstrated the ability to take complete charge of a modern marine power plant while underway at sea.

401. MARINE AUXILIARY SYSTEMS. (2-2). Credit 3. Study of the principal shipboard auxiliary systems, including: auxiliary fired-boilers, sea water service, ballast, freshwater service, lubricating oil, fuel oil storage and transfer, distilling, and steering systems. Major components, operation and maintenance, and interrelationship with other auxiliary systems are covered. Additional topics include steam turbine, gas turbine, and diesel-driven electric power generators and support systems, as well as propulsion train power take-off type electric power generation systems. Prerequisites: MARE 304, 305.

402. SHIPBOARD AUTOMATION AND CONTROL. (3-0). Credit 3. Study of automation in marine power plants; including electronic and pneumatic proportional, integral and derivative control elements; applications in boiler combustion and water level control; engine speed control; remote sensing and performance monitoring systems. Prerequisites: MARE 307, 311, 312.

403. MARINE TECHNOLOGY AND THE ENVIRONMENT. (3-0). Credit 3. Study of environmental protection requirements such as the Oil Pollution Act of 1990, Code of Federal Regulations, and international agreements and conventions addressing prevention of pollution of the seas by oil and sewage. In addition, atmospheric pollution from propulsion plant exhaust gas is addressed. Ships' structure and systems, operational requirements, and licensed-officer liabilities are discussed.

404. MARINE AIR CONDITIONING & REFRIGERATION. (3-0). Credit 3. Study of refrigeration processes, refrigerants, psychometrics, air conditioning and refrigeration systems, and operation and maintenance of AC&R systems. Prerequisite: MARE 304.

405. FUNDAMENTALS OF NAVAL ARCHITECTURE. (3-0). Credit 3. Ship geometry and arrangement; ship-form calculations; intact and damaged stability; ship's structure; fundamentals of resistance and propulsion; ship motion, maneuverability, and control; introduction to ship design, construction, and overhaul. Prerequisite: MARE 309.

406. MARINE ENGINEERING TECHNOLOGY PROJECTS. (3-0). Credit 3. Team approach to analysis and design of basic marine industry-level projects, in particular marine propulsion plants including efficiency enhancement for conventional steam and diesel plants,

regenerative and steam injected gas turbine propulsion plants, and combined cycle plants. Additional topics include transmission and drive systems, and propulsors; integration of concepts learned in previous required courses; capstone learning experience. Prerequisites: MARE 311, 312, and MARE 401.

485. PROBLEMS. Credit 1-3 each semester. Special problems in marine engineering technology not covered by any other course in the curriculum. Work may be in either theory or laboratory. Approval of department head.

489. SPECIAL TOPICS. Credit 1-4 each semester. Selected topics in an identified area of marine engineering technology. May be repeated for credit. Prerequisite: Approval of instructor.

Marine Fisheries (MARF)

423. MARICULTURE. (3-3). Credit 4. Study of factors determining the success of efforts to cultivate estuarine and marine species of economic importance for use as human food. Mariculture practices used worldwide in the production of algae, mollusks, crustaceans, and fishes will be discussed. Prerequisite: Curriculum junior or approval of instructor.

445. MARINE FISHERIES MANAGEMENT. (2-2). Credit 3. Basic knowledge from marine ichthyology, biology of fishes and biological oceanography related to applied aspects of marine fisheries sciences. Emphasis placed on management techniques applicable to tidal-influenced inland water, estuaries, and oceans. Prerequisite: Approval of instructor.

481. SEMINAR IN MARINE FISHERIES. (1-0). Credit 1. Critique of articles from the current marine fisheries literature. Emphasis placed on evaluation of methods and results reported in scientific papers. Prerequisites: Curriculum junior approval of instructor.

482. SEMINAR IN MARINE FISHERIES. (1-0). Credit 1. Compilation of literature pertaining to topics in marine fisheries. Emphasis placed on preparation of a written report and presentation of a synopsis of that report. Prerequisites: Curriculum junior or approval of instructor.

485. PROBLEMS IN MARINE FISHERIES. Credit 1-6 per semester. Special topics and problems in field and/or laboratory work suited to analysis by individuals or small groups concerning aspects of marine fisheries. Usually requires a report describing techniques and results. Only 3 credit hours may be used in the degree plan curriculum. Prerequisites: 2.25 GPR, curriculum sophomore and approval of instructor.

489. SPECIAL TOPICS. (4-0). Credit 4. Selected topics in an identified area of Marine Fisheries. May be repeated for credit.

Marine Sciences (MARS)

101. INTRODUCTION TO MARINE SCIENCES. (1-0). Credit 1. A non-technical introduction to the field of marine sciences, including biology, ocean activities, and marine industries. Course includes lectures, seminars, outside speakers, and industrial contacts.

110. GENERAL OCEANOGRAPHY. (3-0). Credit 3. Survey of oceanography including the history of marine and maritime research and progress, introduction to the world ocean, basic principles of the marine sciences, open-ocean environments, and coastal environments. Course is designed to maximize at-sea experience aboard the T/S TEXAS CLIPPER II.

250. BASIC PROGRAMMING. (2-2). Credit 3. Introduction to microcomputers and BASIC as a programming language; algorithms, storage, conditional clauses, arrays, matrices, functions, character strings, routines/subroutines, word processing, spread sheets, and data bases.

306. STRATIGRAPHY AND SEDIMENTATION. (3-3). Credit 4. Principles of stratigraphy and study of environments of deposition. Laboratory work in sampling, analyzing, and interpreting sedimentary rocks. Field trips required. Prerequisite: Approval of instructor.

310. FIELD METHODS IN MARINE SCIENCES. (1-6). Credit 3. Techniques of documenting collected materials, the methods of reconnaissance and the mapping of traverses in the major coastal environments. Sampling and recording techniques, interview procedures, and the use of maps and remotely sensed imagery will be introduced. Prerequisites: CHEM 112, PHYS 202 OR PHYS 219, GEOL 104 or approval of instructor.

330. PETROLEUM GEOLOGY. (3-0). Credit 3. Origin, migration and accumulation of petroleum. Reservoir rock, traps, accumulation and conditions, and subsurface methods. Prerequisite: Approval of instructor.

340. GEOCHEMISTRY. (3-0). Credit 3. Chemical principles and processes that govern the behavior of geologic materials. Silica and carbonate low temperature equilibrium and kinetics. Prerequisites: CHEM 101, 102; or approval of instructor.

360. BIOCHEMISTRY. (3-0). Credit 3. General introductory biochemistry; structures of lipids, saccharides and nucleotides; amino acids and protein structure; relationship of protein structure to biochemical reactivity; kinetics (and inhibition) of enzyme-catalyzed reactions; membrane phospholipids and glycoproteins and the structure and function of membranes; catabolic reaction pathways of monosaccharides and fatty acids; oxidative phosphorylation. Prerequisites: BIOL 114, CHEM 228, or CHEM 227 and consent of instructor.

370. COASTAL PROCESSES. (3-0). Credit 3. Introduction to the coastal system, waves and wave-dominated coasts, shoreline morphodynamics, tidal and lake coasts, long-term coastal development, sea level changes, subtidal and beach ecosystems, coastal dunes and wetlands, structures and organizations, coastal management, and coastal hazards. Prerequisite: GEOL 104.

375. SCIENCE OF FLUIDS. (3-0). Credit 3. Classical fluid mechanics; fundamental physical principles. Fluid statics, principles of fluid motion, frictionless flow, surface waves, viscous flows, turbulence, molecular basis of fluid mechanics. Prerequisites: MATH 251, PHYS 218 or approval of instructor.

376. INTRODUCTION TO UNIX AND C. (3-0). Credit 3. Introduction to the Unix operating system and C-Language programming in a multi-user networked environment.

380. INTRODUCTION TO PHYSICAL CHEMISTRY. (3-0). Credit 3. Classical thermodynamics with applications to gases, liquids, solutions, and phase equilibria. Kinetics and transport properties of gases. Statistical mechanics, spectroscopy, instrumentation, and quantum theory at the survey level. Prerequisites: CHEM 101, 102, III AND II2; MATH 151.

405. WATERBORNE TRANSPORTATION OF HAZARDOUS CHEMICALS. (3-0). Credit 3. Basic concepts associated with the transportation of hazardous chemicals in congested port areas, along the nation's inland waterways, and at sea. Special emphasis on the hazards of fire, health, air and water pollution and chemical reactivity. Promulgation of safe operating practices by industry, the USCG and IMO. Prerequisite: CHEM 101.

410. INTRODUCTION TO PHYSICAL OCEANOGRAPHY. (3-0). Credit 3. Introduction to elements of the physics of the ocean; descriptive aspects and theoretical explanations of circulation, characteristic structure, and waves. Prerequisites: MATH 251 or equivalent; PHYS 219 or equivalent, or approval of instructor.

415. REMOTE SENSING TECHNOLOGY. (3-0). Credit 3. An introduction to the uses of remote sensing technology in the marine sciences, including electromagnetic, acoustic, and seismic methods. Generation, transmission, and reception methods. Active and pas-

sive systems, multispectral techniques, and signal analysis systems. Prerequisites: PHYS 202 OR 219, BIOL 114, and junior standing or consent of the instructor.

430. INTRODUCTION TO GEOLOGICAL OCEANOGRAPHY. (3-0). Credit 3. Introduction to geological processes in the marine system: Physiographic provinces, origin and evolution of basins, shelves, slopes, and beaches. Geological sampling and geophysical methods; coastal beach and estuarine processes. Prerequisite: GEOL 104 or approval of instructor.

435. EXPLORATION GEOPHYSICS. (3-0). Credit 3. Physiomechanical properties of rocks and sediments. Seismic refraction and refraction principles applicable to offshore, coastal and onshore exploration. Determination of media velocity and stratigraphy from refraction and refraction studies in both marine and non-marine systems. Prerequisites: PHYS 202 OR PHYS 219, GEOL 104, MATH 151 or approval of instructor.

440. INTRODUCTION TO CHEMICAL OCEANOGRAPHY. (3-0). Credit 3. Introduction to chemical processes in the marine environment. Composition of sea salt, chemical speciation of dissolved material in the ocean. Biogeochemistry of oxygen, major elements, nutrient elements, and some trace metals in the surface and deep ocean. Formation, chemical composition, and alterations of detrital material and marine sediments. Simple models which relate ocean chemistry to the circulation of identifiable masses of water. Radioisotopes and stable isotopes in chemical oceanography. Prerequisite: CHEM 102.

450. ELECTRICAL AND PHYSICAL MEASUREMENTS. (2-3). Credit 3. Study of basic instrumentation pertinent to marine sciences and biology as well as simple circuit design and digital electronics. Laboratory emphasizes spectroscopy, environmental measurements, and basic oceanographic measurements. Prerequisites: CHEM 102, PHYS 202 OR PHYS 219, MATH 151.

481. SEMINAR. (1-0). Credit 1. Problem-oriented discussion session. Topics and reports selected for current relevance. May be repeated once only for credit. Prerequisite: Approval of department head.

485. PROBLEMS. Credit 1-6 each semester. Special topics and problems suited to analysis by individuals or small groups concerning special aspects of marine sciences. Prerequisite: Approval of department head.

489. SPECIAL TOPICS IN MARINE SCIENCES. Credit 1-4. Study of selected topics in an identified area of marine sciences. Prerequisite: Approval of instructor.

Marine Transportation (MART)

301. OCEAN TRANSPORTATION I. (4-0). Credit 4. Shipping in the world economy. Production of service; shipping process, equipment, labor, conferences, rate-making, role of government. Buying of service by shipper, finance of shipping, international conventions and treaties. Prerequisite: NAUT 201 or concurrent enrollment.

302. MARINE CARGO OPERATIONS I. (3-3). Credit 4. Objectives and problems with break-bulk cargo handling during loading, discharging, and in-transit carriage. Requirements of special refrigerated and dangerous cargoes. Heavy lift operations with conventional cargo gear and its restraints. Cargo loss prevention, safety and related documentation, as well as log book entries, modern cargo concepts-containerization, roll-on roll-off, lash, and others. Maximum cargo efficiency with relation to space, cargo gear, crew and labor costs. Practical cargo gear use and cargo observations during lab periods. Prerequisite: NAUT 200, 202, 301 or concurrent enrollment.

304. OCEAN TRANSPORTATION II. (3-0). Credit 3. Marine insurance problems and cases and how they relate directly to a ship's officer. Hull, cargo, and personal injury cases are examined from the officer's and insurers' points of view. Introduction to Admiralty

Law and the court process for seamen's rights and ship owner's privileges. Actual hearings and trials are observed to complete the background. Prerequisite: MART 301 or approval of department head.

321. MARITIME LAW I. (2-0). Credit 2. Basic laws governing vessel navigation; International and U.S. Inland Rules for the prevention of collision at sea, and the safety of life at sea convention. Prerequisite: NAUT 200.

406. MARINE CARGO OPERATIONS II. (3-2). Credit 4. Principles and practice of bulk liquid, gas handling, and carriage by water craft. Theoretical and practical problems involved in loading, stowing and discharging of petroleum, chemical, elevated temperature and cryogenic cargoes. Marine pollution abatement, personnel safety, and firefighting techniques and systems. Prerequisites: MART 302, NAUT 300.

416. PORT OPERATIONS, ADMINISTRATION AND ECONOMICS. (3-0). Credit 3. Concepts of the port and methods of intermodal transfer. Port functions divided and analyzed along business lines: economics, management, finance, accounting, and marketing. Cost studies. Prerequisite: ECON 452, MART 301, MGMT 105, or approval of MART department head.

421. MARITIME LAW II. (3-0). Credit 3. Essential principles of admiralty, general maritime, and international law as applicable to the marine industry and ocean shipping. Evolution and state of the law concerning maritime liens, ship mortgages, rights of seamen and harbor workers, limitation of liability, bills of lading and cargo carriage, collision liability, general average, marine salvage, charter parties, and international rights and responsibilities of ships and shipping. Prerequisites: MART 301, 321, or MARA 212.

481. SEMINAR. (0-2). Credit 1. Problem-oriented discussion session. Topics and reports selected for relevance to current problems. Prerequisite: Approval of department head.

485. PROBLEMS. Credit 1-4. Directed study in problems in marine transportation not covered by other courses in the department. Prerequisite: Senior classification or approval of department head.

489. SPECIAL TOPICS IN MARINE TRANSPORTATION. Credit 1-3. Study of selected topics in an identified area of marine transportation or nautical science. Prerequisite: Approval of MART department head.

Maritime Administration (MARA)

212. BUSINESS LAW. (3-0). Credit 3. Legal principles affecting managerial decisions including: contract law, agency, law of business entities, inclusive of partnership, limited partnership and corporation; creditors' rights, debtor protection; and the Uniform Commercial Code; negotiable instruments and sales. Prerequisite: Sophomore classification. (BUSI 2301) Note: BUSI 2301= MGMT 212= MARA 212.

363. THE MANAGEMENT PROCESS. (3-0). Credit 3. Management as an academic discipline is defined and its evolution sketched. Goal setting; planning, controlling, and decision-making; models for thinking about organizations; organization design; organization change; models for understanding individual behavior; job performance and job satisfaction; interpersonal behavior, motivation and leadership, behavior in work groups; and careers in management. Prerequisite: Junior classification.

373. PERSONNEL MANAGEMENT. (3-0). Credit 3. Relationship of the personnel function to the whole organization; manpower planning; recruitment; selection, including employment application; separation; compensation; training; performance appraisal; labor relations and safety. Prerequisites: MARA 363 or approval of MARA department head.

401. BROKERAGE AND CHARTERING. (3-0). Credit 3. Operational and legal environ-

ment of ship brokerage and chartering; responsibilities of owner and charterer under various charter forms; American, British and Canadian acts governing charters and bills of lading; rules and regulations concerning loading and discharging. Prerequisites: BANA 303, ECON 203.

402. INLAND WATERWAYS. (3-0). Credit 3. Development of inland waterways of the U.S. and federal policies relating to them. Port and terminal development, competition with other transportation forms, manpower, rates, environmental concerns and the impact of waterway systems on regional economies. Prerequisites: BANA 303, ECON 203.

435. LABOR LAW AND POLICY. (3-0). Credit 3. Federal and state public policy and law regulating collective bargaining and issues in employment discrimination law. Legal environment of labor relations; conspiracy doctrine applied to labor union; labor injunctions; Norris-LaGuardia Act; Wagner Act; Taft-Hartley Act; National Labor Relations Board; control of bargaining unit; strikes, lockouts, and picketing; secondary boycotts; National Emergency Labor Disputes; Landrum Griffin Act; legal bases of public section unionism; race, sexual and religious discrimination in employment. Prerequisite: Senior classification or approval of MARA department head.

460. MANAGEMENT SYSTEMS AND CONTROL. (3-0). Credit 3. Applications of management planning and control techniques to complex organizational problems and management decision-making tasks; socio-technical work systems and human-machine systems; basic system theory and concepts; basic control theory and concepts; systems design process; systems analysis techniques such as simulation models and sensitivity analysis; information technology and management information systems; program and project management; and special-purpose planning and control systems.

466. MANAGEMENT POLICY. (3-0). Credit 3. Policy problems of business organizations; top management problem-solving and decision-making; planning; appraising the business environment; the firm's financial, human and physical resources; forecasting, developing objectives and strategies; evaluating alternatives; implementing strategies; measuring results; profitability and social responsibility. Use of case analysis. Prerequisite: MARA 460.

470. ENVIRONMENTAL LAW. (3-0). Credit 3. Designed to provide a broad background of basic statutes, regulations, and cases dealing with the major issues in international and federal environmental law. Specifically, the course will focus on pragmatic training in statutory, regulatory, and treaty reading and interpretation; analysis of administrative and legislative intent for law. Prerequisites: Junior or senior classification.

481. SEMINAR IN MANAGEMENT. (1-0). Credit 1. Discussions and observation of current management practice in the public and private sectors of the nation. Reading and discussion of current events and changes taking place in management theory and/or its application and practice in actual business and government situations. May be repeated for credit. Prerequisites: Junior classification or approval of instructor.

485. PROBLEMS. Credit 1-4. Directed study on selected problems in the area of Maritime Administration not covered in other courses. Prerequisite: Approval of MARA department head.

489. SPECIAL TOPICS. Credit 1-3. Study of selected topics in an identified area of Maritime Administration.

Maritime Systems Engineering (MASE)

205. ENGINEERING MECHANICS I. (3-0). Credit 3. Statics, basic vector operations, mechanics of particles and rigid bodies. Center of gravity, analysis of structures, friction,

moments of inertia. Prerequisite: MATH 151, PHYS 218.

206. ENGINEERING MECHANICS II. (3-0). Credit 3. Dynamics; scalar and vector solutions of relative linear velocities and acceleration; kinetics; dynamics of translation and rotation; work; energy; impact; momentum. Prerequisite: MARE 205.

209. MECHANICS OF MATERIALS. (3-0). Credit 3. Introduction to the study of stresses, strains, and deformation of a solid body which results when static forces are applied. Transformation of stresses and strains, torsion, beam deflection, and combined loadings are discussed. Prerequisite: MARE 205.

301. DYNAMICS OF WAVES AND STRUCTURES. (3-0). Credit 3. Prediction of loads due to wind, current, and waves; introduction to concepts of linear structural dynamics and to the design of ocean structures; mooring and towing analysis; fluid-structure interactions; vibration of submerged structures. Prerequisites: CVEN 345; OCEN 300 or concurrent enrollment therein.

303. MARINE THERMODYNAMICS I. (3-0). Credit 3. Energy concepts. First and second law of thermodynamics. Carnot and Rankine principles and reversible heat cycles. Properties and processes of vapors, vapor-power cycles, and vapor refrigeration cycles. Prerequisite: MATH 161.

309. MARINE CONSTRUCTION MATERIALS. (3-3). Credit 4. Introduction to materials science; study of the properties of materials as related to marine engineering design and applications. Laboratory includes experimental testing of material properties and heat treatment techniques. Prerequisite: MARE 209.

310. ENGINEERING ANALYSIS. (3-0). Credit 3. Application of numerical methods to ocean-related engineering problems; development, evaluation, and comparison of various techniques for root finding, curve fitting, numerical integration, simultaneous linear algebraic equations, matrix methods, probability and statistics, and ordinary differential equations in ocean-related engineering applications. Prerequisites: ENGR 109 and MATH 308.

336. FLOW MEASUREMENT FUNDAMENTALS. (2-2). Credit 3. Introduction to fundamental principles of measuring fluctuating velocities in flows, emphasis on the properties of lasers particularly relevant to Laser Doppler Measurements; probe methods for velocity measurement. The laboratory includes the experimental investigation of surface waves and classic fluid dynamic problems. Prerequisites: PHYS 219, CVEN 311 or concurrent enrollment.

401. MEASUREMENTS IN THE OCEAN. (3-0). Credit 3. Introduction to laboratory and field techniques for measuring engineering parameters in the ocean environment. Fundamentals of underwater acoustics and the use of these fundamentals in ocean measurement systems. Fundamentals of remote sensing by satellites. Prerequisites: OCEN 300 or approval of instructor.

405. FINITE ELEMENT ANALYSIS IN ENGINEERING DESIGN. (3-0). Credit 3. Introduction to the fundamental theory and techniques; direct approach and energy formulation; element equations, assembly and solution schemes; computer implementation, design considerations; applications to field problems; original computer project required. Prerequisites: MARE 209, CVEN 345, MASE 310.

407. DESIGN OF OCEAN ENGINEERING FACILITIES. (1-6). Credit 4. Design of structures, equipment and systems for the ocean; environmental, logistical, and reliability requirements. Complete design process followed through a group design project. Delineation of alternatives, constraints, economics and environmental consequences included to strengthen real-life problem solving skills. Prerequisite: OCEN 300, 400.

410. MEASUREMENTS IN THE OCEAN LABORATORY. (0-3). Credit 1. Fundamental techniques and instrumentation for field and laboratory measurements pertaining to ocean engineering (e.g., temperature, depth, force, currents, wave height, sound velocity, surveying, etc.) experiment planning; data analysis and data presentation; written reports describing planning, analysis and results of experiments. Prerequisites: MASE 301, OCEN 400 and MASE 401 or registration therein.

411. HYDRODYNAMICS OF THE COASTAL ZONE. (3-0). Credit 3. Basic ideas and assumptions, long waves over shallow bottom, estuary as a stratified media, salinity intrusion, diffusion and dispersion phenomenon in coastal water, mass transport in estuary modeling of estuary circulation, sediments and sedimentation in estuary. Prerequisite: OCEN 462.

415. MARINE STRUCTURES DESIGN. (3-0). Credit 3. Forcing function of surface waves and currents. Dynamics of marine structure, deterministic and probabilistic approaches to fixed structure design, design project-dynamic analysis of a fixed offshore structure from a given design wave. Prerequisite: OCEN 300.

483. MARINE FOUNDATION ANALYSIS AND DESIGN. (3-3). Credit 4. Design of foundations for onshore, alongshore, and offshore structures, including predication of settlement and the bearing capacity of shallow and deep foundations; determination of earth pressure acting on retaining structures and design of steel and concrete bulkheads; design of pile foundations; and design of cofferdams and caissons. Laboratory tests conducted to determine the physical and engineering properties needed for application in geotechnical engineering design. Prerequisites: CVEN 344, CVEN 345, AND CVEN 346, CVEN 365.

485. PROBLEMS IN MARITIME SYSTEMS ENGINEERING. Credit 1-8. Directed study on selected current problems in the ocean and/or maritime industry. Offered to enable individuals or groups to undertake and complete with credit some specialized investigation not covered by other courses. Prerequisite: Approval of department head.

489. SPECIAL TOPICS IN MARITIME SYSTEMS ENGINEERING. Credit 1-4. Special topics in identified areas of maritime systems engineering. Prerequisite: Approval of instructor.

Marketing (MKTG)

321. MARKETING. (3-0). Credit 3. Institutions, processes, and problems involved in transferring goods from producers to consumers; economic and social aspects. Prerequisite: ECON 202 and junior classification.

Mathematics (MATH)

106. PLANE AND SPHERICAL TRIGONOMETRY. (4-0). Credit 4. Definitions of trigonometric functions; evaluation of functions of special angles, fundamental relations; solution of triangles; trigonometric reductions; angular measure; functions of composite angles; logarithms, inverse trigonometric functions; trigonometric equations; basic ideas and formulas of spherical trigonometry; solution of spherical trigonometry; solution of spherical triangles, application to terrestrial and astronomical triangles.

130. MATHEMATICAL CONCEPTS—PRE-CALCULUS. (3-0). Credit 3. Functions and their graphs. Analytical geometry; linear and quadratic functions, polynomial functions. Trigonometric functions. Exponents.

131. MATHEMATICAL CONCEPTS—CALCULUS. (3-0). Credit 3. Limits and continuity. Rates of change, slope. Differentiation: the derivative, maxima and minima. Integration: the definite and indefinite integral techniques, curve fitting. Prerequisite: MATH 130 and

equivalent. Credit will not be given for more than one MATH 121, 131, 142, 151, and 171.

150. FUNCTIONS, TRIGONOMETRY, AND LINEAR SYSTEMS. (3-2). Credit 4. Graphs, functions, college algebra and trigonometry, linear systems and vectors.

151. ENGINEERING MATHEMATICS I. (3-2). Credit 4. Rectangular coordinates, analytical geometry, functions, limits, derivatives of functions, applications, integration, areas and volumes by integration. Prerequisites: High school algebra, trigonometry and geometry or satisfactory performance on qualifying exam. Credit will not be given for more than one of MATH 121, 131 142, 151, and 171.

161. ENGINEERING MATHEMATICS II. (3-2). Credit 4. Differentiation and integration techniques and their applications, improper integrals, approximate integration, analytical geometry, infinite series, power series, Taylor series. Prerequisite: MATH 151 or equivalent.

166. TOPICS IN CONTEMPORARY MATHEMATICS II. (3-0). Credit 3. Finite mathematics, matrix theory, probability theory, game theory. Credit will not be given for more than one of MATH 141 AND 166.

251. ENGINEERING MATHEMATICS III. (3-0). Credit 3. Vector calculus, calculus of functions of several variables, partial derivatives, directional derivatives, gradient, multiple integration, line integrals, Stoke's theorems. Prerequisite: MATH 161 or equivalent.

304. LINEAR ALGEBRA. (3-0). Credit 3. Introductory courses in linear algebra covering abstract ideas of vector space and linear transformations as well as models and applications of these concepts, i.e., systems of linear equations, matrices and determinants. Prerequisite: MATH 152 or 161.

308. DIFFERENTIAL EQUATIONS. (3-0). Credit 3. Linear ordinary differential equations, solutions in series, solutions using Laplace transforms, systems of differential equations. Prerequisite: MATH 251 or equivalent.

485. PROBLEMS. Credit 1 or more. Special problems in mathematics not covered by any other course in the curriculum. Work may be in either theory or laboratory. Prerequisite: Approval of department head.

Meteorology (METR)

302. WEATHER REPORTS AND FORECASTING. (3-0). Credit 3. Basic description of atmospheric characteristics and processes relevant to the understanding of weather patterns and atmospheric principles.

Microbiology (MICR)

351. FUNDAMENTALS OF MICROBIOLOGY. (3-4). Credit 4. Basic microbiology; comparative morphology, taxonomy, pathogenesis, ecology, variation, physiology of microorganisms. Prerequisites: CHEM 227, 237; three hours of biology; or approval of instructor.

Nautical Science (NAUT)

103. MARITIME ORIENTATION AND LIFESAVING. (2-3). Credit 3. Introduction to the maritime industry, the ships, the seaman, and the purpose of the U.S. Merchant Marine. Shipboard nomenclature, cargoes, and recent trends in the marine industry. Practical lifeboat and lifesaving training for certification as Lifeboatman by the U.S. Coast Guard.

200. BASIC COMMUNICATIONS, NAVIGATION AND SEAMANSHIP. Credit 4. Practical application of student's classroom studies aboard training ship during first training cruise. Student completes basic projects in communications, navigation, seamanship and rules of the road. Prerequisite: NAUT 103, 203, 204 or permission of MART department head.

201. NAVAL ARCHITECTURE I. (3-2). Credit 4. Description of ship as self-sustaining unit. Shipbuilding nomenclature and dimensions, types of construction, and classification of merchant ships. Classification societies, shipbuilding materials and methods, and structural components of ships. Prerequisite: NAUT 103.

202. NAVAL ARCHITECTURE II. (3-0). Credit 3. Ship's lines drawing and form calculations; principles of floatation and buoyancy; inclining experiments, free liquids, transverse stability; motion of ships in waves, seaway and dynamic loads, ship structure tests. Prerequisite: NAUT 201.

203. SEAMANSHIP I. (2-3). Credit 3. Intermediate lifeboat, lifesaving and firefighting procedures. Practical use in lab of manila lines, wire, splicing, knots, block and tackle, cargo gear, anchoring, mooring, and steering gear operations. Introduction to the International Rules of the Road. Projects aboard merchant, research and offshore oil vessels in the ports of Galveston and Texas City. Prerequisite: NAUT 103 or concurrent enrollment.

204. TERRESTRIAL NAVIGATION. (2-2). Credit 3. Fundamentals of piloting, chart construction and development, aids to navigation, useful publications, principles of magnetism and the magnetic compass, great circle, Mercator and middle latitude sailing. Prerequisite: Algebra and trigonometry recommended.

300. INTERMEDIATE COMMUNICATIONS, NAVIGATION AND SEAMANSHIP. Credit 4. Practical application of student's classroom studies aboard training ship during second training cruise. Student completes intermediate projects in communications, navigation, seamanship, and Rules of the Road. Thorough study made of U.S. Public Health requirements in first aid. Prerequisite: METR 302, NAUT 200, 301, 303 or permission of MART department head.

301. SEAMANSHIP II. (2-3). Credit 3. Mechanical appliances aboard ship, accident prevention, vessel sanitation, marine inspection laws and regulations, search and rescue procedures, communications. Prerequisite: NAUT 203 or concurrent enrollment.

302. SEAMANSHIP III. (1-3). Credit 2. Principles and methods of propulsion and steering of ships. Ship handling in narrow channels and heavy seas, docking, undocking, mooring and towing. Prerequisite: NAUT 202, 301 or concurrent enrollment.

303. CELESTIAL NAVIGATION. (2-3). Credit 3. Full range of celestial navigation. Survey of nautical astronomy, sight reduction, sextants, compass error determination, and solutions of the navigational triangle by various methods. Prerequisites: NAUT 200, 204 or permission of MART department head.

304. ELECTRONIC NAVIGATION. (2-2). Credit 3. Theory, operation and application of marine electronic navigation aids and systems; marine gyro compass, radio direction finder, Loran, Omega, Decca, satellite, echo sounder, Doppler and integrated navigation systems. Marine radar theory, operation and interpretation. Student examined for U.S. Coast Guard Certification as "Radar Observer" following completion of course. Prerequisite: NAUT 303.

400. ADVANCED COMMUNICATIONS, NAVIGATION AND SEAMANSHIP. Credit 4. Practical application of student's classroom studies aboard training ship during third training cruise. Student completes advanced projects in communications, navigation, seamanship and Rules of the Road. Prerequisites: NAUT 200, 300, 302, 304; MART 321, 406.

404. THE NAVIGATOR. (2-3). Credit 3. Intensive, in-depth review of the principles of electronic, celestial, and terrestrial navigation in preparation for the U.S. Coast Guard examination for Third Mate. Prerequisites: NAUT 204, 304, 400.

Naval Science (NVSC)

101. INTRODUCTION TO NAVAL SCIENCE. (2-1). Credit 2. Sea power and the naval service; mission, organization, regulations, and broad warfare components of the Navy; overview of officer and enlisted rank and rating structures, procurement and recruitment, training and education, promotion and advancement, and retirement policies. Basic tenants of naval courtesy and customs, discipline, naval leadership, and ship's nomenclature. Major challenges facing Naval officers; areas of equal opportunity and drug/alcohol abuse. Prerequisite: Approval of department head.

102. NAVAL SHIP SYSTEMS I. (3-0). Credit 3. Introduction to naval ship systems. Types, structure, and purpose of naval ships; ship propulsion systems; auxiliary power systems; interior communication and damage control; elements of ship design and stability characteristics. Prerequisite: NVSC 101 or approval of department head.

200. NAVAL SCIENCE FOR THE MERCHANT MARINE OFFICER. (3-0). Credit 3. Organization of the U.S. Navy (including the Naval Control of Shipping Organization) with discussion of the Merchant Marine Naval Reserve commission in order to provide a sound basis for liaison between the U.S. Navy and the Merchant Marine. Seapower will be analyzed and Naval damage control procedures and underway replenishment procedures will be introduced.

201. NAVAL SHIP SYSTEMS II. (3-0). Credit 3. Theory and principles of operation of naval weapons systems; types of weapons and fire control systems, capabilities and limitations, theory of target acquisition, identification and tracking, trajectory principles, and basics of naval ordnance. Prerequisite: NVSC 102 or approval of department head.

301. NAVIGATION AND NAVAL OPERATIONS I. (2-2). Credit 3. Theory, principles, and procedures of ship navigation in coastal and open ocean environments; piloting, celestial navigation, ocean and tidal currents and associated publications and logs; introduction to USN electronic and satellite navigation systems. Prerequisite: NROTC advanced classification.

302. NAVIGATION AND NAVAL OPERATIONS II. (2-2). Credit 3. Duties and responsibilities of the OOD (U/W), navigator and bridge watch team during routine and special at sea evolutions; relative motion, formations tactics, internationals and inland Rules of the Nautical Road and applied aspects of ship handling; familiarization with naval communications and messages. Prerequisite: NVSC 301.

402. LEADERSHIP AND MANAGEMENT II. (2-0). Credit 2. Naval junior officer responsibilities; division management and administration; current Navy policies and their application within the division. Prerequisite: NVSC 401.

485. PROBLEMS. Credit 1-3. Directed study in problems in the field of naval science not covered by other courses in department. Prerequisite: Senior classification and approval of department head.

489. SPECIAL TOPICS IN NAVAL SCIENCE. Credit 1-4. Selected topics in identified areas of naval science. Prerequisite: Approval of instructor.

Ocean Engineering (OCEN)

300. OCEAN ENGINEERING WAVE MECHANICS. (3-0). Credit 3. Physical and mathematical fundamentals of ocean wave behavior. Mechanics of wave motion. Use of statistics and probability to develop design wave criteria. Prerequisite: CVEN 311 OR MEEN 213.

400. BASIC COASTAL ENGINEERING. (3-0). Credit 3. Mechanics of wave motion. Wave refraction, diffraction, and reflection. Wave forecasting. Shore processes. Planning of coastal engineering projects. Design of seawalls, breakwaters, and fixed offshore installations.

Offshore pipelines. Dredging. Control of oil spills in estuaries and at sea. Prerequisite: CVEN 311; OCEN 300.

462. HYDROMECHANICS. (3-0). Credit 3. Kinematics of fluids, incompressible, irrotational and turbulent flow. Navier-Stokes equations, flow of viscous fluids. Prerequisites: CVEN 311; MATH 308.

Oceanography (OCNG)

251. OCEANOGRAPHY. (3-0). Credit 3. Overview of the ocean environment; interrelation of the subdisciplines of ocean sciences; importance of the oceans to human beings; human impact on the oceans. Prerequisite: Concurrent registration in OCNG 252 if necessary for meeting the 8 credit hour science core curriculum requirement.

252. OCEANOGRAPHY LABORATORY. (0-2). Credit 1. Practical laboratory experiments and exercises demonstrating principles of ocean sciences. May include weekend field trips. Prerequisite: OCNG 251 or registration therein.

401. INTRODUCTION TO OCEANOGRAPHY. (3-0). Credit 3. Quantitative survey of interdisciplinary relationship between biological, chemical, geological, geophysical, and physical aspects of the ocean. Prerequisites: Approval of instructor; junior or senior classification; MATH 131 or equivalent and CHEM 101.

420. INTRODUCTION TO BIOLOGICAL OCEANOGRAPHY. (3-0). Credit 3. Biological aspects of the marine environment. Use of the sea and problems of productivity, pollution, and fouling and boring organisms. Prerequisites: BIOL 114; junior or senior classification.

489. SPECIAL TOPICS. Credit 1-4. Selected topics in an identified area of oceanography. May be taken two times for credit. Prerequisite: OCNG 251 or 401 or approval of instructor.

Philosophy (PHIL)

240. INTRODUCTION TO LOGIC. (3-0). Credit 3. Methods and principles used to distinguish between correct and incorrect reasoning; uses of language, informal and formal fallacies, Venn diagrams, truth-tables, symbolic notation, formal deductive proof, induction.

Physics (PHYS)

201. COLLEGE PHYSICS. (3-3). Credit 4. Fundamentals of classical mechanics, heat, and sound. Prerequisite: MATH 150 or equivalent. (PHYS 1401).

202. COLLEGE PHYSICS. (3-3). Credit 4. Continuation of PHYS 201. Fundamentals of classical electricity and light; introduction to contemporary physics. Prerequisite: PHYS 201. (PHYS 1402).

218. MECHANICS. (3-3). Credit 4. Mechanics for students in science and engineering. Prerequisite: MATH 151 or registration therein. (PHYS 2425).

219. ELECTRICITY. (3-3). Credit 4. Continuation of PHYS 218. Electricity, magnetism and introduction to optics. Prerequisite: MATH 161 or equivalent; PHYS 218. (PHYS 2426).

485. PROBLEMS. Credit 1-4. Special work in laboratory or theory to meet individual requirements in cases not covered by regular curriculum. Prerequisite: Approval of department head.

Political Science (POLS)

206. AMERICAN NATIONAL GOVERNMENT. (3-0). Credit 3. Survey of American national government, politics, and constitutional development.

207. STATE AND LOCAL GOVERNMENT. (3-0). Credit 3. Survey of state and local government and politics with special reference to the constitution and politics of Texas.

331. INTRODUCTION TO WORLD POLITICS. (3-0). Credit 3. Analysis of contemporary world from point of view of nation-state; political problems, factors involved in foreign policies and relations of nations. Prerequisite: POLS 206 or approval of department head.

340. INTRODUCTION TO PUBLIC ADMINISTRATION. (3-0). Credit 3. American public administration; development of public service; theories of organization and management, executive leadership and policy formation, bureaucratic politics, administrative accountability, and personnel practices. Prerequisite: POLS 206 or approval of department head.

347. POLITICS OF ENERGY AND THE ENVIRONMENT. (3-0). Credit 3. U.S. energy and environmental problems and politics and the political, legal, and institutional factors influencing their development and implementation. Prerequisite: POLS 206 and approval of department head.

485. PROBLEMS. Credit 1-6 each semester. Individual instruction in selected aspects of political science not adequately covered by other courses. Prerequisite: Approval of department head.

Psychology (PSYC)

107. INTRODUCTION TO PSYCHOLOGY. (3-0). Credit 3. Introductory course dealing with elementary principles of human behavior.

Spanish (SPAN)

101. BEGINNING SPANISH I. (3-2). Credit 4. Elementary language study with oral, written and reading practice. Preparation for conversation. Part of class preparation will be done in language laboratory. Students with prior instruction are required to take the Spanish Placement Test before enrolling for the first time in college Spanish course.

102. BEGINNING SPANISH II. (3-2). Credit 4. Continuation of SPAN 101. Part of class preparation will be done in language laboratory. Prerequisite: SPAN 101. Students with prior instruction in Spanish are required to take the Spanish Placement Test before enrolling the first time in a college Spanish course.

Speech Communication (SCOM)

203. PUBLIC SPEAKING. (3-0). Credit 3. Training in speeches of social and technical interest designed to teach students to develop and illustrate ideas and information and to inform, stimulate, and persuade their audiences.

Wildlife and Fisheries Science (WFSC)

420. ECOLOGY FOR TEACHERS. (3-0). Credit 3. Lectures, discussions, and readings in principles of ecology and their application in today's problems in environmental conservation. Prerequisites: Junior or senior classification.

T H E F A C U L T Y

The faculty and administrative positions are current as of spring, 1996. Figures in parentheses indicate date of first appointment at the University and date of appointment to present positions, respectively.

ALLISON, MEAD A., Assistant Professor of Oceanography (1995). B.S., College of William and Mary, 1985; M.S., East Carolina University, 1988; PH.D., State University of New York, Stony Brook, 1993.

ALTENBURG, RYSA L., Lecturer in General Academics (Math) (1996). B.A., M.A., Georgian Court College, 1993, 1995.

ANZ-MEADOR, PHILLIP D., Lecturer in Oceanography (Physics Laboratory) (1989). B.S., M.S., PH.D., Baylor University, 1982, 1985, 1989.

BAKER, JAMES E., Lecturer in Marine Transportation (1993). B.S., U.S. Merchant Marine Academy, 1949.

BALABAN, ALEXANDRU T., Research Scientist in Oceanography (1993). Diploma, Radiochemist, PH.D., Polytechnic Institute, Bucharest, Rumania, 1953, 1957, 1959.

BALDWIN, JANETTA, Lecturer in General Academics (Kinesiology) (1980, 1994). B.S., University of Texas at Austin, 1969; M.S., Texas A&M University, 1980.

BANNEEL, NATALIE, Lecturer in Marine Biology (1993). B.S., University of the Witwatersrand, 1985; M.S., Texas A&M University, 1993.

BASILOTTO, JOHN P., Lecturer in Maritime Administration (1994). B.S., M.B.A., University of Dayton, 1968, 1974.

BASKARAN, M., Research Scientist and Senior Lecturer in Oceanography (1988, 1995). B.S., V.H.N.S.N. College, 1977; M.S., School of Physics, Kamaraj University, Madurai, 1979; PH.D., Physical Research Laboratory, Ahmedabad, 1985.

BLACK, SANDRA A., Lecturer in Marine Biology (1993). B.S., Towson State University, 1977; M.S., University of Texas Medical Branch, 1990.

BLOZINSKI, ANTHONY P., Associate Professor of General Academics (Mathematics) (1976, 1980). B.S., Seattle University, 1966; M.S., PH.D., Purdue University, 1968, 1970.

BOLER, JAMES S., Lecturer in General Academics (Mathematics) (1985). B.A., PH.D., Rice University, 1971, 1974.

BOURGEOIS, PETER J., Lecturer in Marine Transportation. B.S., U.S. Merchant Marine Academy, 1956.

BREWINGTON, ROBBIE L., Lecturer in General Academics (Anthropology) (1996). B.S., University of Houston—Clear Lake, 1989; Doctoral Candidate, Texas A&M University, 1996.

BRIGHAM, KIMMETT, M., Lecturer in General Academics (Kinesiology) (1994). B.S., University of Southwestern Louisiana, 1973; M.S., Prairie View A&M University, 1993.

CARHART, JOHN W., Lecturer in General Academics (Political Science) (1988). B.A., M.A., Southwest Texas State University, 1981, 1988.

CHANG, TYNE-HSIEN (TED), Associate Professor of Maritime Systems Engineering and Head of Maritime Systems Engineering (1981, 1991). B.S., National Chen-kung University, 1974; M.S., PH.D., University of Florida, 1978, 1981.

CHILDERS, DANIEL L., Lecturer in Marine Biology, (1993). B.A., University of Virginia, 1983; M.S., University of South Carolina, 1985; PH.D., Louisiana State University, 1989.

CIMINELLO, VITO J., JR., Lecturer in Maritime Administration, (1994). B.A., Brown University, 1977; M.S., Northwestern University, 1979.

CLAYTON, WILLIAM H., President Emeritus (1971) (1987). B.S., Bucknell University, 1949; PH.D., Texas A&M University, 1965.

COLE, COLLIER M., Lecturer in General Academics (Psychology) (1983). B.A., University of California at Los Angeles, 1971; M.A., PH.D., University of Houston, 1973, 1976.

COLEMAN, CHARLES H., JR., Lecturer in Oceanography and Director of the Geology Laboratory (1981, 1992). B.S., Texas A&M University, 1975; M.S., University of Houston–Clear Lake, 1986.

COLEMAN, GERARD T., Senior Lecturer in Marine Engineering Technology (1996). B.S., U.S. Naval Academy, 1980; M.S., George Washington University, 1996.

CORKE, HENRY E., Lecturer in Oceanography (Physics Laboratory) (1977). B.S., M.S., PH.D., University of Houston, 1961, 1963, 1970.

CURLEY, STEPHEN J., Professor of General Academics (English) and Head of the Department of General Academics (1973, 1985, 1996). B.A., Fordham University, 1968; PH.D., Rice University, 1974.

DAVIS, RANDALL W., Professor of Marine Biology and Head of Marine Biology (1990, 1994). B.S., University of California, Riverside, 1974; PH.D., University of California, San Diego, 1980.

DUCE, ROBERT A., Professor of Oceanography and Meteorology and Dean, College of Geosciences and Maritime Studies (1992). B.A., Baylor University, 1957; PH.D., Massachusetts Institute of Technology, 1964.

ESTES, ERNEST L., III, Professor of Oceanography and Maritime Systems Engineering (Geology) and Head of Marine Sciences (1976, 1987, 1996). B.S., Lawrence University, 1965; M.S., Duke University, 1967; PH.D., University of North Carolina, 1971.

EVANS, WILLIAM E., Professor of Oceanography, Wildlife and Fisheries Science and Marine Biology, (1989, 1989, 1991). B.S., Bowling Green State University, 1953; M.A., Ohio State University, 1954; PH.D., University of California at Los Angeles, 1975.

FITZHUGH, THOMAS C., III, Lecturer in Maritime Administration (1996). B.S., Texas A&M University, 1971; J.D., University of Texas, 1976.

FOLDEN, CHARLES A., Lecturer in Oceanography (Chemistry Laboratory) (1980). B.S., California State University, Long Beach, 1975; M.A., Governors State University, 1979.

FORD, STEPHEN F., Senior Lecturer in Marine Transportation (1988). B.S., U.S. Merchant Marine Academy, 1970; M.B.A., University of Houston, 1978.

GIAM, CHOO-SENG, Professor of Oceanography (Chemistry) and Director of the Coastal Zone Laboratory (1988). B.S., University of Malaya, 1954; B.S., M.S., PH.D., University of Saskatchewan, 1955, 1961, 1962.

GILL, GARY A., Associate Professor of Oceanography (1992, 1996). B.S., University of Washington, 1976; M.S., PH.D., University of Connecticut, 1980, 1986.

GLENN, WILLIAM, Lecturer in Maritime Administration and Marine Transportation (1994). B.S., Texas A&M University, 1981; J.D., Franklin Pierce Law Center, 1992.

GRACIA, PETE A., Lecturer in General Academics (Mathematics) (1993). B.S., Lamar University, 1959; M.S., University of Houston–Clear Lake, 1991.

GRIFFIN, LAWRENCE L., Associate Professor of Oceanography (Chemistry) (1976, 1984). B.A., M.S., PH.D., University of Texas at Austin, 1962, 1965, 1972.

GUILLEN, GEORGE G., Lecturer in Marine Biology (1991). B.S., M.S., Texas A&M University, 1979, 1983.

HARPER, DONALD E., JR., Associate Professor of Marine Biology (1975, 1980.) B.S., University of Miami, 1963; M.S., PH.D., Texas A&M University, 1966, 1970.

HAYMES, WILLIAM E., Lecturer in Oceanography and Director of the Physics Laboratory (1989, 1992). B.S., M.S., University of Missouri–Rolla, 1964, 1971; PH.D., University of Manchester, England, 1976.

HAYNES, JAMES L., Lecturer in Marine Transportation (1991). B.S., University of Nebraska, 1965.

HAUPT, KARL, Lecturer in Marine Transportation (1995). B.S., Texas A&M University at Galveston, 1981.

HENDRIX, DANIEL E., Lecturer in Marine Science (Physics Laboratory) (1996). B.A., Case Western Reserve University, 1960.

HITE, GERALD E., Associate Professor of Oceanography and Maritime Systems Engineering (Physics) (1980, 1984). B.S., Case Western Reserve, 1962; M.S., University of Illinois, 1965; PH.D., University of Illinois, 1967; Habilitation, Universitat Kaiserslautern, 1974.

IBARRA, MICHAEL J., Lecturer in Marine Sciences (Chemistry Laboratory) (1989, 1995). B.S., Southwest Texas State University, 1976; M.S., University of Texas at San Antonio, 1983.

ILIFFE, THOMAS M., Assistant Professor of Marine Biology (1989, 1991). B.S., Penn State University, 1970; M.S., Florida State University, 1973; PH.D., University of Texas Medical Branch, 1977.

JAMES, ARTHUR P., Assistant Professor in Maritime Administration (1995). B.A., Birmingham–Southern College, 1971; M.A. University of Alabama, 1974; PH.D., University of Missouri–Columbia, 1989.

JOHNSON, THOMAS S., Associate Professor of General Academics (English) (1974, 1981). B.A., Loyola University of Los Angeles, 1966; M.A., University of California at Los Angeles, 1968; PH.D., University of Texas at Austin, 1973.

- JONES, GLEEN., Professor of Oceanography (1996). B.A., University of Rhode Island, 1977; M.S., Columbia University, 1979; PH.D., Columbia University, 1983.
- JONES, VICTORIA L., Lecturer in Maritime Systems Engineering, (1993). B.S., Texas A&M University at Galveston, 1991; M.S., University of Florida, 1993.
- KANZ, JAMES E., Associate Professor of Marine Biology (1978, 1985). B.A., University of Washington, 1966; PH.D., Tufts University, 1973.
- KLEIN, DOUGLAS J., Professor of Oceanography (Chemistry, Physics) (1979, 1987). B.S., Oregon State University, 1965; M.A., PH.D., University of Texas, 1967, 1969.
- KNOX, KRIS J., C.P.A., Lecturer in Maritime Administration (1984). B.B.A., M.B.A., University of Houston, 1979, 1984; PH.D., University of Texas Health Science Center at Houston, 1992.
- KUHLMANN, DEBORAH J., Lecturer in General Academics (English) (1986). B.A., Texas Christian University, 1970; M.A., University of Arkansas, 1980, PH.D., Texas Christian University, 1985.
- LANDRY, ANDRÉ M., JR., Professor of Marine Biology (1977, 1991). B.S., Tulane University, 1968; M.S., PH.D., Texas A&M University, 1971, 1977.
- LANDRY, CHARLES W., Lecturer in Maritime Administration (1993). B.S./B.A., University of Southwestern Louisiana, 1966; M.S., University of Southern Mississippi, 1967; PH.D., University of Arkansas, 1972.
- LANG, DONNA C., Lecturer in Maritime Administration (1996). B.S., Texas A&M University, 1988; M.A., University of Houston—Clear Lake, 1992.
- LEITZELL, TIMOTHY R., Lecturer in Marine Transportation and Maritime Administration (1988). B.S., State University of New York, 1968; M.B.A., University of Houston, 1975.
- LESKO, MELANIE J., Senior Lecturer in Oceanography (Chemistry) (1983, 1991). B.S., Lamar University, 1972; PH.D., University of Houston, 1977.
- LEVIN, PHILLIP S., Assistant Professor in Marine Biology (1994). B.A., University of Texas, 1984; PH.D., University of New Hampshire, 1993.
- LUKENS, RICHARD W., Department Head, Marine Engineering Technology (1996). B.S., University of Oklahoma, 1976; M.S., Naval Post Graduate School, 1983.
- MACEO, DEBRA, Lecturer in General Academics (Kinesiology) (1994). B.S., Lamar University, 1975. M.A., University of Houston, 1995.
- MAGNUSON, ALLEN H., Senior Lecturer in Marine Systems Engineering (1996). B.S., University of Michigan, 1964; M.S., Pennsylvania State University, 1967; PH.D., University of New Hampshire, 1972.
- MANNELLI, SANDRA C., Lecturer in Oceanography (Chemistry Laboratory) (1989). B.S., Texas A&M University, 1983; M.A., University of Houston—Clear Lake, 1986.
- MCCLOY, JAMES M., Professor of Oceanography (Marine Geography) and Department Head of Maritime Administration (1971, 1984, 1995). B.A., California State College at Los Angeles, 1961; PH.D., Louisiana State University, 1969.
- MCGLASHAN, ROBERT, Lecturer in Maritime Administration (1995). B.S./M.B.A., Southern Methodist University, 1957-1965; PH.D., University of Texas, 1968.
- MCMULLEN, WILLIAM T., Professor in Maritime Administration and superintendent of the Texas Sate Maritime Program (1995). B.S., State University of New York Maritime College, 1964; M.B.A., University of Houston, 1973; PH.D., University of Wales, 1993.
- MERRELL, WILLIAM J., Professor of Oceanography (1987, 1992), Vice Chancellor of Strategic Programs, Texas A&M University System. B.S., M.A., Sam Houston State University, 1965, 1967; PH.D., Texas A&M University, 1971.
- MOHAMMAD, GOLAM, Assistant Professor of Maritime Administration (1990, 1991). B.A., M.A., University of Dacca, 1976, 1977; M.S., University of Kentucky, 1983; PH.D., Ohio State University, 1989.
- NANCE, JAMES M., Lecturer in Marine Biology (1993). B.S., M.S., Brigham Young University, 1974, 1976; PH.D., Texas A&M University, 1984.
- PAWLOWSKI, JAMES F., Lecturer in General Academics (Mathematics) (1994). B.A., St. Michael's College, Winooski, Vermont, 1963; M.S., University of Vermont, 1965; PH.D., University of Houston, 1975.
- PAYNE, DEBORAH ANN, Lecturer in Marine Biology (1993). B.A., University of Texas at Austin, 1985; PH.D., University of Texas Medical Branch, 1993.
- PENUEL, VIC, Lecturer in General Academics (English) (1994). B.A., University of Houston—Clear Lake, 1989; M.A., University of Houston—Clear Lake, 1994.
- PICCARDO-LA VALLEE, OLIMPIA M., Lecturer in General Academics (Spanish) (1990). B.A., M.S., Universidad Central de Venezuela, Caracas, 1964, 1966.
- POTTER, DARYL K., Officer in Charge (Naval Science) (1994). B.S., Naval Academy, 1990.
- RAY, SAMMY M., Professor Emeritus of Marine Biology (1990). B.S., Louisiana State University, 1942; M.S., PH.D., Rice University, 1952, 1954.
- RHOADES, ALICE J., Lecturer and Librarian (1991). B.S., Baylor University, 1976; M.L.I.S., University of Texas at Austin, 1987.
- RYAN, JAMES G., Associate Professor, General Academics (History) (1990, 1996). B.A., M.A., University of Delaware, 1970, 1973; M.A., PH.D., University of Notre Dame, 1975, 1981.
- RUSSELL, HOLLY, Assistant Officer in Charge (Naval Science) (1995). B.A., University of Idaho, 1991.
- SANTSCHI, PETER H., Professor of Oceanography (1988). B.S., Gymnasium Berne, Switzerland, Matura, 1963; M.S., PH.D., University of Berne, 1971, 1975; Privatdozent, Switzerland Federal Institute of Technology, 1984.
- SCHLEMMER, FREDERICK C., II, Associate Professor of Oceanography (1978, 1985). B.S., U.S. Naval Academy, 1965; M.A., University of South Florida, 1971; PH.D., Texas A&M University, 1978.
- SCHMALZ, THOMAS G., Professor of Oceanography (Chemistry, Computer Science) (1981, 1996). B.S., Montana State University, 1970; PH.D., University of Illinois, 1975.

SCHMIDLY, DAVID J., Professor of Wildlife and Fisheries Science and Campus Dean (1992). B.S., M.S., Texas Tech University, 1966, 1968; PH.D., University of Illinois—Champaign/Urbana, 1971.

SCHWARZ, JOHN R., Professor of Marine Biology (1976, 1986). B.S., PH.D., Rensselaer Polytechnic Institute, 1967, 1972.

SEITZ, WILLIAM A., Professor of Oceanography (Chemistry, Computer Science) (1977, 1988). B.A., Rice University, 1970; PH.D., University of Texas at Austin, 1973.

STEVENSON, SAMUEL, Lecturer in Marine Transportation (1996). B.S., Texas A&M University at Galveston, 1989; M.S., Maine Maritime Academy, 1994; J.D., University of Miami Law School, 1996.

STREETER, DON C., Senior Lecturer in General Academics (English) (1990, 1993, 1995). B.S., University of Minnesota, 1933; M.A., PH.D., State University of Iowa, 1938, 1948.

STRODE, CONNIE B., Associate Campus Dean for Academic and Administrative Services (1995). B.A., Northeast Louisiana University, 1970; M.A., PH.D., University of Arkansas, 1989, 1992.

SUEN, CHING Y., Associate Professor of General Academics (Mathematics) (1984, 1990). M.S., Tsing Hua University, 1978; PH.D., University of Houston, 1983.

SZUCS, JOSEPH M., Professor of General Academics (Mathematics) (1980, 1991). B.S., PH.D., Szeged University, 1965, 1994.

THOMAS, JOHNSON P., Lecturer in Oceanography (Geology Laboratory) (1994). B.S., M.S., University of Kerala, India, 1983, 1985; M. TECH., PH.D., Indian Institute of Technology, 1988, 1994.

TOMBRELLO, JOSEPH F., Lecturer in Marine Sciences (Physics Laboratory) (1995). B.S., M.S., University of Alabama at Birmingham, 1983, 1987.

VAZQUEZ, JOSÉ H., Lecturer in Maritime Systems Engineering (1995). B.S., University of Houston, 1989; M.S., University of Houston, 1990; PH.D., University of Houston, 1995.

VON ZHAREN, WYNDYLYN M., Associate Professor of Maritime Administration (1990, 1994). B.A., M.A., ED.D., University of Florida; J.D., University of South Carolina Law School, 1987.

WANG, Y.H., Professor of Maritime Systems Engineering (1980). B.S., National Taiwan University, 1952; M.S., San Jose State University, 1962; PH.D., University of Southern California, 1972.

WARDLE, WILLIAM J., Associate Professor of Marine Biology (1973, 1983). B.S., Lynchburg College, 1963; M.S., PH.D., Texas A&M University, 1970, 1974.

WATSON, DIANE B., Lecturer and Librarian (1988). B.S., University of Oklahoma, 1968; M.L.S., Vanderbilt University/Peabody College, 1973.

WEBB, JAMES W., Associate Professor of Marine Biology (1978, 1988). B.S., University of South Carolina, 1966; M.S., University of Georgia, 1973; PH.D., Texas A&M University, 1977.

WEISINGER, KATHRYN R., Lecturer in General Academics (English) (1994). B.A., University of Texas at Austin, 1976; M.A., University of Houston—Clear Lake, 1984.

WEIST, NATALIE H., Lecturer and Library Director (1982). B.A., Pennsylvania State University, 1971; M.S., Drexel University, 1973; M.S., University of Tennessee, 1980.

WHITAKER, ROBERT E., Lecturer in Oceanography (1987). B.A., M.S., PH.D., Texas A&M University, 1961, 1971, 1973.

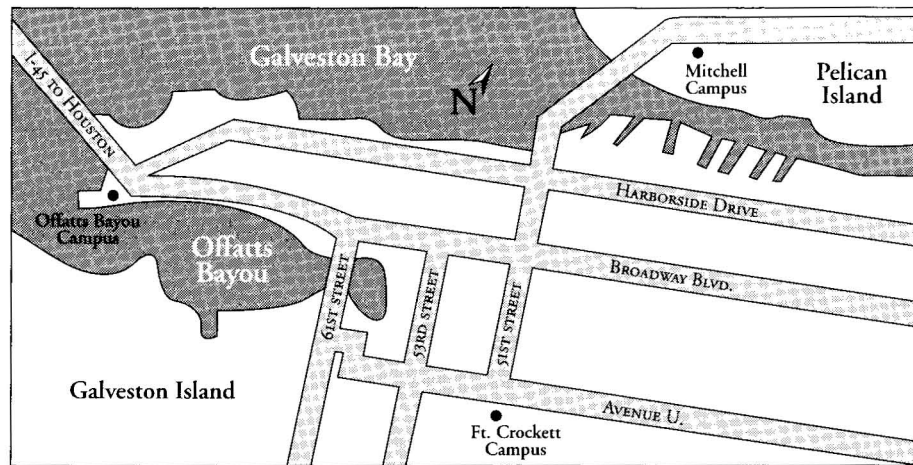
WILLETT, DONALD E., Associate Professor of General Academics (History) (1985, 1993). B.A., St. Edward's University, 1972; M.A., Stephen F. Austin University, 1976; PH.D., Texas A&M University, 1985.

WILSON, PAUL C., Lecturer in Maritime Systems Engineering (1981). B.S., Texas A&M University, 1948; M.S., University of Houston, 1974.

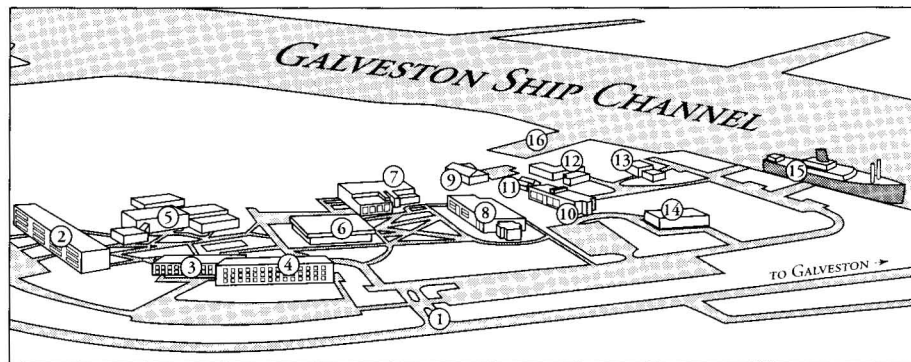
WORTHY, GRAHAM, A.J., Associate Professor of Marine Biology (1990, 1994). B.S., M.S., PH.D., University of Guelph, Canada, 1979, 1982, 1985.

WURSIG, BERND W., Professor of Marine Biology (1989). B.A., College of New Rochelle, 1969; B.S., Ohio State University, 1971; PH.D., State University of New York, Stony Brook, 1978.

TAMUG CAMPUSES



The Mitchell Campus



Key

- | | |
|--------------------------------------|-------------------------------------|
| 1. Main Entrance | 9. Administrative Services Building |
| 2. Dormitory C | 10. Kirkham Hall |
| 3. Dormitory A | 11. Texas Oil Spill School |
| 4. Dormitory B | 12. Physical Services Building |
| 5. Physical Education Facility | 13. Oceanography Building |
| 6. Mary Moody Northen Student Center | 14. Engineering Laboratory |
| 7. Jack K. Williams Library | 15. Training Ship TEXAS CLIPPER II |
| 8. Classroom/Laboratory Building | 16. Small Boat Basin |

Dr. Stephen Curley, Head
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For More Information Contact the:
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